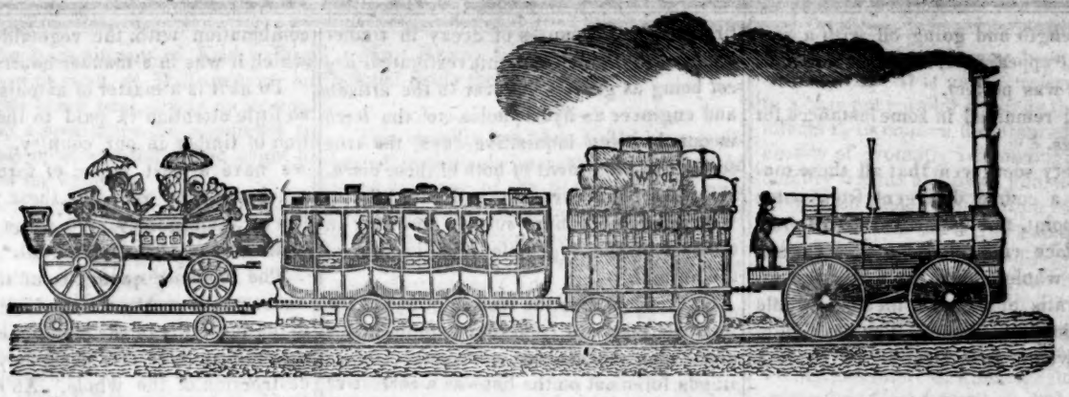

AMERICAN RAILROAD JOURNAL,

AND ADVOCATE OF INTERNAL IMPROVEMENTS.

PUBLISHED WEEKLY, AT NO. 132 NASSAU STREET, NEW-YORK, AT FIVE DOLLARS PER ANNUM, PAYABLE IN ADVANCE.

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CONTENTS:

AMERICAN RAILROAD JOURNAL.

NEW-YORK, NOVEMBER 19, 1836.

LOCOMOTIAE ENGINES.

The demand for Locomotive Engines has been such that it was with great difficulty that companies could be supplied either in this country or in England—and we are gratified to be able to say that the NEWCASTLE MANUFACTURING COMPANY have so increased the number of their workmen as to be able to furnish several first rate Engines immediately to companies now in want of them.

Orders for the following described Engines will be received by us, at the Office of the *Railroad Journal;* and immediate attention given to them.

FOR SALE.—Three *Locomotive Engines;* built by the New-Castle manufacturing company; and now ready for delivery.—They are suited for a track of 4 feet 8½ inches wide. The boilers are 7 feet long, 36 inches diameter and contain each 109, copper tubes 1¾ inches diameter, with 11 inch cylinders and 16 inches stroke; standing on six wheels, two of which, viz. the *driving* wheels, are 5 feet diameter. Engine weighs about 7½ tons. All the materials are of the first quality, and the workmanship we believe will bear comparison with any other, either American or European. The price of each, with tender, water cocks, feed hose &c., complete, is $7500, delivered at the wharf in this place.

Engines of this Company's manufacture are in use on the Boston and Providence Railroad, and the following copy of William Raymond Lee's letter, will show the opinion entertained of them by those who are every way competent to judge. Office, B. & P. R. R. Co.

BOSTON, May 12, 1836.

Mr. E. A. G. YOUNG of Newcastle, Del.

Dear Sir, I take pleasure in communicating to you, the minutes of a trial made with the Locomotive, recently received from your shop, they need no comment, and are perfectly satisfactory, in relation to the power of the machine.

Left Boston 4 minutes past 12, with twelve cars, loaded with 87,670 lbs., of iron, gross weight, behind the Engine (exclusive of tender) 60.5 tons,—made the 8 mile post 28 minutes past 12 o'clock, (rate twenty miles per hour)—made 17¾ miles out (1 hour and three minutes) 1 o'clock and seven minutes P. M.—having run over the last 5.95 miles in twenty-five minutes, passing up ascents of 37½ and 45 feet per mile for the distance of 4.8 miles—with regard.

Your obedient servant, signed

W. RAYMOND LEE.

METEORS OF NOV. 12TH AND 13TH.

Much discussion has arisen in the scientific world upon the question of the yearly appearance of this phenomenon.

At present we believe that but few attempt to deny the fact. It is in our power to prove the fact from personal observation.

While off the port of Pernambuco in the year 1832, the writer of this article witnessed a similar display to that of the night and morning of Saturday and Sunday last. The fact was registered in his journal, but the date was not remembered until two years after, when the subject excited considerable attention—on a reference to the diary the date was found to be Nov. 12th and 13th. This being a year before the famous "shower of stars," another link is added to the chain of evidence.

During the night of Saturday and morning of Sunday last, we kept a careful lookout, and at last were well rewarded for the trouble.

It may not be out of the place to state here, that from 8 o'clock in the evening til day break, constant flashes of lightning, it is supposed, were seen in the east; precisely like what is called heat lightning in summer.

At 9 o'clock, a very beautiful column of Auroral light shot up in the N. W., of a pinkish hue, and continued for 6 minutes. During the whole night there was a strong but ill defined light in the north.

The temperature of the air was moderate, the wind right from the west, and the deposit of dew very great.

The air was of unusual transparency, and the stars shone with increased beauty. Thus a fine opportunity was afforded for observation, and at a season when such nights are not frequently seen.

A few meteors were noticed through the evening, but at 2 o'clock on looking out, several were seen to cross the Great Bear in rapid succession, several leaving behind them a trail.

From this time till daylight constant observations were made.

From 2 o'clock till 3 o'clock, 98 meteors were counted.

From 3 o'clock till 4 o'clock, 150 were seen.

The enumeration was continued until over 300 were seen, and then no farther account was taken. About 400 in all were seen.

Of these the greater number were large and exceedingly brilliant, leaving a trail

of some length and going off with a sort of explosive appearance. The resemblance to a rocket was perfect.

The trail remained in some instances for two minutes.

It was very soon seen that all these meteors had a course divergent from some common point, this point was ascertained and its place confirmed by observations during the whole night. At times the remaining trails of 3 or 4 meteors would clearly indicate its place. The position of this point was in Leo, Dec. 21° 30′ N., R A 150.°

Not more than two or three very smal meteors (such as are seen during any night) were observed to deviate from this course, excepting one or two of greater size which appeared to describe in a short space, a semicircle.

Those meteors that originated near to this point of radiation, appeared to pass over less space and to move more slowly—in fact the impression was irresistible, that the meteors all had the same direction toward the spectator and being seen in prospective appeared to radiate from the point.

Jupiter and Mars in the early part of the night and afterwards Venus afforded opportunities for comparison as to brilliancy of light. These planets are in favorable positions, and Venus in particular is very brilliant—but they were all eclipsed by the light of several of the meteors—one in particular for outshining Venus—to a casual observer it would have seemed a brilliant rocket set off at a short distance.

From the position of the observers, facing the N. E. is it probable that not more than half of the meteors were seen—from which it may be estimated that over 1000 appeared in the course of the night.

The dawn was one of surprising beauty, the pearly day light melting it to a deep rich blue in the zenith and being lost in a clear orange brown in the horizon. Jupiter and Mars in close vicinity over head, Venus in the clear light, and Sirrus with the stars of Orion in the deep blue. Even the brilliant meteors shot through the day light close by Venus, still exceeding her in splendor.

The appearance of the phenomenon was in all respects similar to that witnessed by the writer two years ago, the number of meteors that appeared then was perhaps greater.

This curious phenomenon is one of great interest to us, it being first observed and its annual re-appearance first conjectured, if we are not mistaken, in our country.

It is desirable that all the information on the subject should be collected, from this body of evidence, new light may be thrown upon the subject.

DURABILITY AND PRESERVATION OF TIMBER.—This is one of the most important subjects to which the attention of Engineers and mechanics can be directed. Until recently the causes of decay in timber had been unknown and uninvestigated, *dry rot* being as great a bugbear to the artisan and engineer as hydrophobia to the *leech* in our bustling inquisitive days, the true course and treatment of both of these diseases have been earnestly and carefully investigated, with more success however in the case of the vegetable than in that of the animal.

Our readers must be well informed of the methods proposed from time to time—some more and others less successful. Lime stands foremost on the list—as a corrective to fermentation and acidity, it is undoubtedly useful. We saw recently a remarkable instance of its preservative powers recorded in one of our exchanges.

A platform had been used for mixing mortar and had been continued in the same place (on the surface of the ground in an exposed situation,) and in the same use for nearly sixty years. At the end of that time the ground being wanted for other purposes the platform was directed to be removed, and as it was grown over with weeds and covered with a film of soil it was supposed that it would crumble to pieces. To the surprise of those removing it, they found it to be perfectly sound as much so as if it had been recently made from sound timber.

In this case however the preservative effect is rather to be ascribed to the mortar acting as an indurated covering, than to the lime penetrating the fibre of the wood. Both causes however may have operated in conjunction to produce an effect that neither would have accomplished unaided by the other.

But the most efficient preventive to decay is *corrosive sublimate* used in solution. This is now well known in Europe as Kyan's process. It has been introduced with constant success into the different Naval establishments in Great Britain, and large tanks are erected for the purpose of soaking the timber of any size.

The cost of this preparation is not great and when the importance of the object in view is considered, much money will be saved by it.

It was found upon trial that sail cloth exposed to damp and close air, after having been prepared resisted the mildew while unprepared cloths placed in the same situation fell to pieces.

It was objected to the introduction of this process that the corrosive sublimate being a virulent poison, would endanger the lives of those living in the vicinity of article so prepared. It was found however by one of the best chemists of the day, that after soaking in water until no more sublimate could be obtained, even from stuffs of the finest texture, that the preservative effects were still the same.

In fact he found that the corrosive sublimate had entered into a sort of chemical combination with the vegetable fibre, by which it was in a manner neutralized.

To us it is a matter of astonishment that so little attention is paid to the preservation of timber in our country. It is true we have a vast region of forest yet untouched by the axe—but these cannot last forever, and moreover no pains are taken to renew them when removed.

The immense quantities of timber used in our public works should direct attention to the durability of the material employed—as a failure in certain parts may cause the destruction of the whole. An instance of this in one of the Southern Railroads is well know. The rails were supported upon piles without any embankment—when after a short time it was found that the timber was disposed to a peculiar rot, rendering the road liable to accidents of the most serious consequence.

Though Wood enters largely into the structure of most of our railroads—we do not think that sufficient provision has been made for its durability, and we most earnestly desire to see the subject thoroughly sifted, and experiments made with a view to some specific preservative process.

The application of *corrosive sublimate* is certainly worthy of trial—the effects of coal-tar and other proposed preservative should also be examined.

The question as to the propriety of wooden pavements for our strees, and also for the roadway of suspension bridges is now seriously discussed. The only objection of force is the liability to decay in most kinds of wood when exposed in a vertical position, the moisture entering in the direction of the fibre, and finding its way easily to the very heart.

We have no doubt of the efficacy of Kyan's process in this case, and recommend the trial as of the greatest importance.

A very interesting and exceedingly useful subject of inquiry is the comparative value of our different kinds of timber in different situation, some remaining sound while constantly under water or earth, while but few stand alternate exposure, some remain sound longest in one soil while others are to be preferred in a soil of different nature.

This is a wide field and will richly repay those who labor in it, while the benefit to result from such investigation is a sufficient stimulus.

RAILROAD TO ERIE.

Agreeably to public notice a large and respectable meeting of citizens friendly to the construction of a Railroad to Erie, by the route of the West Branch of the Susquehanna, was held at the Exchange on Wednesday evening, Nov. 2, at half past 7 o'clock.

On motion of G. Ralston, Esq. JOHN WHITE was called to the Chair, and WILLIAM BUEHLER appointed Secretary.

A circular from citizens of Erie, calling a Convention to meet at Williamsport on the 16th inst. being read, it was on motion, ordered that a committee be appointed to report to this meeting what action ought to be taken on the subject.

The Chair appointed William B. Reed, Simon Gratz and Gerard Ralston as the committee, who, after retiring for a short time, submitted the accompanying Report and resolutions, which were considered and unanimously agreed to.

Resolved, That the Citizens of Philadelphia fully participate in the solicitude expressed by their fellow citizens of North Western Pennsylvania, for the construction of a continuous line of communication, by Railroad or Canal, between the seaboard and Lake Erie, along the West Branch of the Susquehanna, believing such connexion to be practicable, and in all respects desirable for the promotion of the interests of this city and the Commonwealth at large.

Resolved, That the project of an Internal Improvement Convention, as suggested by the citizens of Erie, to be held at Williamsport, in Lycoming County, on the 16th November, to concert measures for the attainment of the object proposed, meets with our full concurrence and approbation.

Resolved, That this meeting will proceed to elect Delegates to represent Philadelphia in the said Convention, and that such delegates be authorised to fill any vacances which may occur among them.

The meeting then proceeded to the selection of Delegates to represent the City and County of Philadelphia in the Williamsport Convention, when the following gentlemen were duly elected.

CITY.

Nicholas Biddle,	Manuel Eyre,
Simon Cratz,	John White,
William B. Reed.	George Handy,
William J. Leiper,	William H. Keating,
Joseph H. Newbold,	James N. Barker,
Joseph R. Chandler,	Jacob Ridgway,
Gerard Ralston,	Robert Toland,
Walter R. Johnson,	William Buehler,
Charles B. Trego,	Jacob Lex,
Evans Rogers,	B. W. Richards,
Joseph M. Ilvaine,	Gen. R. Patterson,
Joseph T. Mather,	Cheney Hickman,
Thomas Reeves, jr.	J. B. Sutheriand,
Henry C. Carey,	Timothy M. Bryan,

COUNTY.

William Wagner,	Franklin Comby,
George W. Ritner,	Samuel Stevenson,
John Naglee,	Francis J. Harper,
A. S. Roberts,	Robert Carr,
George N. Baker,	Thomas Rotch,
Robert A. Parish,	Henry Leech,
Samuel Harvey,	Richard Peltz,
James Gowen,	James Goodman,
James M. Cormick,	Thomas D. Grover,
Samuel Breck,	Augustus Stevenson,
Samuel Swilt,	Charles Penrose,
J. R. Burden,	

On motion ordered that the report and proceedings be published in all the daily papers.

Adjourned to meet at the call of the Delegates,

JOHN WHITE, Chairman.

WILLIAM BUEHLER, Secretary.

MR. REED, from the committee appointed made the following

REPORT.

This meeting has been called by a number of individuals interested in the public improvements of the State, and desirous especially, to promote the object indicated in the circular from the citizens of Erie, which has just been read. It is scarcely necessary to add any thing in the form either of facts or persuasion to what is stated in that letter; but in order to place before the meeting, as strongly as possible, the inducements to action on the part of our fellow citizens, it may be desirable to submit a few words of further explanation.

In the first place, it will be distinctly understood, that this movement does not contemplate at this juncture, an investment of money, in the form of contribution or subscription of stock. In the present distressed and embarrassed state of the money market an invitation to capitalists to enter into new engagements and incur new responsibilities, would be utterly illusory. No such proposition or suggestion is made; a merely preliminary movement is contemplated, to devise the best mode of *hereafter* completing an important public work, and to determine whether that shall be by State action, or by private contribution at some future and less unpropitious time. That such a period will come, sooner or later, we have no reason to doubt—when it will come, it is not at all important for the purposes of the present meeting to inquire.

Were there no other inducement to accede to the suggestion of the Erie circular, than such as arises from the fact of an invitation having been sent to us, it would in itself be quite sufficient. None but those who have mingled freely either in the course of commercial intercourse, or in the public councils with our fellow citizens of the interior of the State, can realize the importance which is attached to the expression of active sympathy on the part of the commercial men and capitalists of Philadelphia, with their wishes and interests in any favorite public enterprise. Nor is this solicitude on their part at all unreasonable. They think and think justly that every project of public improvement that benefits them, benefits Philadelphia far more; and while they appeal to us to aid them in their views, as citizens jointly interested in the prosperity of the commonwealth, an appeal we have no wish or right to resist, they incidentally address what should be a lively sense of our own interest as inseparably connected with theirs. As an illustration of the feeling on this subject, it may be mentioned, that at the railroad convention held at Bedford, in July last, to devise measures to complete the railway from Philadelphia to Pittsburg, through the southern counties of the State, at which all the middle and western counties were fully represented, the absence of any representation from this city, and the utter indifference which it implied, became the subject of much severe and resentful remark. In that instance, however, the resentment felt and expressed, happened to be misdirected; no notice of an intention to convoke such a convention having been communicated to us. It is merely referred to now, in a case not parallel so far as the invitation affects it, to enforce the propriety and necessity of promptly responding, when our country friends ask us to join them in the discussion and consideration of our common interests. The senseless jealousy between the city and county, which once was so active, to the embarrassment of both parties, and was so sensibly felt in our legislative councils, is nearly extinct—a result attributable altogether to the communion of feeling and interest, which the improvement system has forced upon us, and the happy influence which the accumulated capital of this community, has been made to exercise in its appropriation to remote public works.

There are however, connected with the project now in view, considerations of immediate and substantial interest, which deserve to be strongly presented to the view of our fellow citizens. They can now merely be hinted at—the occasion not permitting more than a very cursory view of them.

It is known to this meeting, that the original draught of the improvement system of Pennsylvania, as contemplated by the legislature and the convention of 1825, had in view a connexion between Philadelphia and Pittsburg, and a connexion between the Atlantic and the Lakes at the harbor of Erie. Whether the latter was to be from the Ohio, or without touching Pittsburg, by the head waters of the Alleghany and west branch of the Susquehanna, was not determined; but by one route or the other the connexion with lake Erie was expressly stipulated. To this effect the faith of the State was solemnly and expressly pledged. Relying on this, the northwestern counties of Pennsylvania, espoused the cause of internal improvement with a zeal, and have adhered to it with a perseverance for which they have not had sufficient credit. Until recently, their reward has been bitter and continued disappointment—year after year—session after session passed by, to bring them only renewed mortification. With the exception of two small pledges of future action in the canal from the mouth of Bever, to New-Castle, in Beaver county, and the French creek feeder, literally, nothing was done. Nor for a long time did there seem to be the prospect of a change. Circumstances to be sure, for which the public authorities were not at all responsible, operated adversely to them. After the unfavorable report of the engineers, as to the supply of water on the West Branch summit, a report in whose accuracy, confidence has been somewhat lessened, and the final adoption of the Juniata route to Pittsburgh, the attention of the public was necessarily directed to a connexion between the Ohio and the Lake, making Pittsburgh a point. This being the case, a conflict of interests immediately arose as to the superior eligibility of the two routes, the one known as the Chenango route through Beaver and Mercer counties—the other by the way of the Alleghany river, through Armstrong and Venango counties to the Lake. In

this conflict, the people at the extremity of the route, in Erie and Crawford counties, had no other interest than to have it adjusted. It continued however, without intermission, for a series of years; nor was it adjusted till last year, when the peculiar form which the Improvement Bill assumed, as well as the increasing conviction of the superiority of the Chenango route, determined the question in its favor.

In all this conflict and throughout all this disappointment, the Representatives of Philadelphia, with a few exceptions, adhered steadily to what they considered the promise of the State, as made in the original plan of improvement, and voted generally, but fruitlessly, for the Erie extension by one route or the other. The session of 1834-5, however brought immediately to the view of the Legislature, improvements which were in all respects, in direct rivalship with the extension to Erie, and which became necessarily the source of renewed disappointment. The cross-cut canals to Ohio, one of the immediate effects of which was to give a preference, as a Lake port, to Cleveland over Erie, were brought forward anew, and in such a form as to give assurance of their ultimate success. Their encouragement gave a keener edge to the disappointment of North Western Pennsylvania, and seemed to justify the apprehension that their Eastern friends, having secured an outlet to the Lake through Ohio, would be carless and indifferent to their favorite work to Erie.

Fortunately, however, owing to circumstances and opportunities to which it is not necessary particularly to refer now, at the session of 1835-6—after ten years deferred hope and anxious exertion—the Legislature were enabled to redeem their pledge, and by a liberal appropriation actually to re-commence the work on the route from the Ohio to the Lake. It has been said that the peculiar form in which the Improvement Bill of last year was framed, led to an adjustment of the ancient difficulty between the rival routes. The decision between them being left to the representatives generally of that section of the State—and those friendly to the Alleghany route being unable conscientiously to support the bill as it was necessarily presented, the western route was without further opposition adopted, and is now under contract.

So far then as the plighted faith of the State was involved, it has been at last redeemed. But so far as the expectations of this city from a participation in the Lake trade are concerned, little has yet been done. The strong inducements which directed all our attention to the speedy completion of the main line to Pittsburgh have been the means of throwing into the shade the only effectual line of communication with the Lakes, viz: by means of the West Branch of the Susquehanna. Attention is now turned to it anew. So zealous and so persevering have been the assertions of the citizens of the upper counties, of the perfect practicability and ease of a railroad, if not a canal communication with the Lakes by this route, that confidence in former adverse representations has been greatly impaired—so much so as to induce the Legislature at its last session, to make a liberal appropriation for new surveys on that line. Should they result favorably as it is believed they will, the only question will be whether the great trade of the Wetsern Lakes is of so little value as to justify Pennsylvania and Philadelphia in relinquishing it to their more enterprising neighbors.

It is to the restless enterprize of those neighbors that we are perhaps indebted for the strongest impulse for action now. Reference to a few significant facts will illustrate what is meant. The city of New-York has with Lake Erie a complete and perfect water communication, by means of the Erie canal. Philadelphia has none.—Nor will she, even when the Erie extension and the cross-cut canals are completed, have such an avenue to the Lakes as will enable us in the seasons of open navigation, to compete with New-York in this respect. Observation of the existing state of things, as well as moderate foresight, has, however, satisfied the public spirited citizens of our sister State, that the trade of the North Western Lakes must seek other outlets than its single canal; and while Philadelphia, with far greater natural advantages, neglects the great opportunity of a direct diagonal line of communication with the Lake which her position might give her—the last year has given birth to two great enterprizes in New-York, directed solely to securing the Lake trade, either of which is deserving of all admiration, in the enlargement of the Erie canal and the constructien of the great New-York and Erie Railroad. If then, New-York considers herself justified in executing new and gigantic enterprizes to secure the great trade of the Lakes to her capital, and if we have it in our power to construct a cheaper, a shorter and better route than she can possibly devise, are we justified in being longer indifferent?

We say a cheaper, shorter and better route. From the Hudson to the harbor of Dunkirk, is a distance of, say, 483 miles. Over this whole distance, a railroad is to be completed at a cost, according to the estimates, of not less than nine millions. Supposing the connexion through Pennsylvania to be by canal, it must be borne in mind that it is already completed as far as the mouth of Tangascootack, on the West Branch. If by railroad, all that need be constructed for the present, will be from the head of the State works just referred to, to the lake and when hereafter, as doubtless it soon will be, a continuous railroad will be required, the only link to be supplied, will be between this north western section of the road, and the progressing works at Sunbury and Catawissa, from either of which points the railroad communication to Philadelphia will be soon completed. The superiority in other respects of the Pennsylvania work is equally decided—both in relation to the point of termination on the lake, and the resources of the country through which it will pass. For while the New-York railroad passes through a country of doubtful fertility and limited mineral product, the Pennsylvania improvement traverses regions of unsurpassed mineral resources, and thence must become the avenue by which not only the lake business will travel to the eastern market, but by which the whole coast of the lakes may be supplied with our iron and coal. As to its termination it is well known that the harbor of Erie is the only safe harbor on the coast from Buffalo to Sandusky. It can be approached with any wind, and is capacious enough to contain all the shipping, which for a long time to come will float upon the upper lakes. In this respect alone, the superiority of the Pennsylvania over the New-York improvment can scarcely be appreciated. The port of Dunkirk, where the New-York and Erie road is to terminate, is believed to be little better than an open Roadstead wholly unprotected, and which will require a very large expenditure, before it can be rendered even ordinarily secure.

In point of freedom from ice in the spring and fall, Dunkirk, distant but 45 miles, can boast of little superiority over Buffalo, which is known to be closed on an average always five weeks earlier and later than Erie. So slight in this respect is the difference between Dunkirk and Buffalo, that it is confidently believed that the interests of the New-York company will induce them when they obtain the consent of Pennsylvania, which can scareely be refused, to extend their work as far westward as Erie, and there to fix its termination. In fact, a company has been already incorporated by New-York to make a Railroad, crossing the New-York and Erie Railroad at Dunkirk, from Buffalo to the State line. The stock has been fully subscribed, and measures will before long be taken to continue the Road from the line to Erie. Should this be done, and no communication effected through Pennsylvania, Erie having become the great depot of the produce of the Lakes, will look altogether to New-York as its metropolis. As Pennsylvanians and Philadelphians, we ought to endeavor to avert this result.

It is not designed in this place to enlarge upon the increasing trade of the Lakes, for the transit of which the New-York works are constructing. It is enough for us to know, that having one line of communication, *they* deem it utterly inadequate, and are actively engaged in designing new ones, while we, without any outlet, have been thus long the indifferent observers of their movements. Let any one cast his eye on the map, and observe the immense tracts of country in the progress of settlement to the North West, possessing a fertile soil, and rapidly filling up with an active and enterprising population, and he will realize how utterly inadequate are all the existing or projected outlets for the business which the exigencies of this vast territory must create and how vast a market for goods from the Eastern cities has, within a few years, sprung up in the wilderness. In 1825 there was but a single steamboat navigating Lake Erie, and that an incommodious vessel, whose engine was not able to propel it at a more rapid rate than four

miles an hour. This season there are at least forty fully equipped steamers on the Lake, and square rigged vessels to the number of nearly 200. And as an illustration of the immense amount of business now done on the lake, mainly in the transportation of emigrants and supplies for their subsistence it is a well ascertained fact, that two citizens of the town of Erie, owners of four of the largest steam vessels on the lake, received during the last year at least $30,000 clear profits from their investments. All this tide of emigration now passes partly along the Canada shore and the St. Lawrence but principally through the Erie Canal. What advantages our New-York neighbors promise themselves from the continuance and increase, may be inferred from the following passage, taken at random from the report of the Directors of the New-York and Erie Railroad Company for 1835.

"If the experience afforded by the Erie Canal be taken as a guide, it may be safely stated that the accomplishment of the proposed work will add not less than one third to the present population and trade of the city of New-York, and augment in an equal degree its landed wealth; and that it will double, if not quadruple the present value of the extensive district, embracing six millions of acres in the southern and middle counties of the State. When it is considered also, that by means of the great avenue of intercourse, and its tributaries now springing up and spreading through all the great vallies of the west, bringing lake Erie into close connexion with the Mississippi and Missouri, and extending southwardly even to the Gulf of Mexico, the immense inland communities upon the western waters for the purpose of trade, will be rendered commercially tributary to the State and metropolis, it becomes difficult to fix within moderate bounds the value of the proposed road, or the amount of travel and transportation which it is destined to create and accommodate."

Such testimony, from such a source, is a significant an admonition to us to arouse to active exertion, as any that could be given. Having secured the command of the trade from the valley of the Mississippi by means of the cross-cut canals, and our main line, we have only to devote our energies and enterprise to active competition for the lake trade, to secure the greater share of it. With a continuous line of Railroad to Erie, by the west branch of the Susquehanna, an intersection of the New-York works by the Williamsport and Elmira Railroad and North Branch Canal, and a railway to the Ohio through the southern counties, our Pennsylvania Improvement System will be complete, to render this Commonwealth the richest and most prosperous of the States, and to make this city, what her position so well enables her to be, the great distributing city of the Union.

These cursory remarks have been made in the earnest hope of calling public attention anew to the proposed public work on the west branch route, as one of the most important, as it actually has been the longest neglected of our enterprizes. The first, and only measure we have now to adopt, is to send an efficient delegation to represent this city in the Williamsport Convention, to co-operate freely and cordially with our fellow citizens in the consummation of this great design.

WILLIAM B. REED,
SIMON GRATZ,
GERARD RALSTON. } Committe.

INTERNAL IMPROVEMENT.

At a meeting of the friends of Internal Improvement, holden at the Court House, in Montpelier, Oct. 27, 1836, His Honor, David M. Camp, was called to the chair as President, and the Hon. Lyman Fitch and Capt. J. Sherman, were appointed Vice Presidents, and Charles Faine Secretary.

The following preamble and resolution were then introduced by the Hon. William Slade, of Middlebury.

Whereas, the internal improvement of a country by roads and canals, is among the most important means for the development of its resources, and its advancement in wealth, population and general prosperity,—And whereas the mild climate and productive soil of the western States, aided by their extensive internal improvements, are holding out inducements which are rapidly drawing off the population and wealth of Vermont to new and more promising fields of enterprise. Therefore

Resolved, That it is expedient to form a *State Internal Improvement Society*, for the purpose of concentrating effort—exciting a spirit of inquiry, and embodying such facts in regard to the agricultural, commercial, manufactures, water power, and mineral resources of this State, as shall enable its people to determine upon the expediency of entering on such a system of Internal Improvement as may tend to advance the value of its staple productions—retain its population—give fresh impulse to its enterprise, and disclose new objects for the employment of the capital, ingenuity and industry of its citizens.

The meeting was then addressed by Messrs. Slade of Middlebury, Story of Coventry, Pierce of Woodstock, Fairbanks of St. Johnsbury, Cahoon of Lyndon, and Stevens of Barnet, in favor of the resolution, when it was unanimously adopted.

Mr. Fairbanks of St. Johnsbury, then moved that a Committee of one from each county be appointed, to nominate officers for the Society, which motion was adopted, and the following named gentlemen appointed said committee:—

Orleans County,		Gov. Crafts,
Franklin	"	John Smith,
Chittenden	"	John Van Sicklin, Jr.,
Grand Isle	"	Melvin Barnes,
Addison	"	Harvey Bell,
Rutland	"	C W. Conant,
Bennington	"	Leonard Sargent,
Windham	"	William Henry,
Windsor	"	F. E. Phelps,
Orange	"	A. B. W. Tenney,
Caledonia	"	Mr. Fairbanks,
Essex	"	Doct. Dewey,
Washingt'n	"	Milton Brown,
Lamoile	"	Levi B. Vilas.

Mr. Slade moved the appointment of a Committee to report a Constitution for the government of the *State Internal Improvement Society*, and Messrs. Slade, Coolidge and Richmond were appointed.

Mr. Waterman of Montpelier, then introduced the following resolution.

Resolved, That a committee of three be appointed by the President, to petition the General Assembly, now in session, to appropriate such sums as may be necessary to defray the expense of surveys of the eastern, western, and central railroad routes, now under contemplation in this State.

The resolution was adopted, and Messrs. C. Paine, of Northfield, Henry, of Rockingham, and Foote, of Rutland, appointed said committee, whereupon the meeting adjourned till Friday evening, Oct. 28th.

FRIDAY EVENING, Oct. 28, 1836.

The convention met, pursuant to adjournment. The committee appointed for that purpose, reported the following:—

CONSTITUTION OF THE VERMONT INTERNAL IMPROVEMENT SOCIETY.

ART. 1. This Society shall be denominated *The Vermont Internal Improvement Society*.

ART. 2. The officers of this Society shall be a President, fourteen Vice Presidents, a Secretary, a Board of Managers, and Committees in each County, as hereinafter provided.

ART. 3. It shall be the duty of the President, and, in case of his absence, the Vice Presidents in the order of their appointment, to preside in all meetings of the Society; and the Secretary shall keep a record of its proceedings.

ART. 4. The Vice Presidents shall be selected from each county in the State, and shall have power, at any time to call county meetings, for purposes connected with the objects of this Society, and shall preside in such meetings.

ART. 5. The Board of Managers, which shall consist of three members of the Society, shall correspond from time to time, with the county committees, and with such other persons as they may deem proper, for the purpose of eliciting such information in regard to the Agriculture, Commerce, Manufactures, Water power, and Mineral, and other resources of Vermont and also in regard to the effect upon these interests, in other States, of improvements by railroads and canals, as shall be deemed useful in determining whether it will be for the interest of the people of this State to undertake such improvements.

ART. 6. There shall be appointed a committee of three persons in each county in this State, whose duty it shall be to institute inquiries in their respective counties, relative to the various subjects specified in the foregoing article, and to report the result of their enquiries to the Board of Managers, on or before the first day of September annually. And the Board of Managers shall, at each annual meeting of the Society, make a report, embodying such information as they may have obtained from the said county committees, or from other sources, touching the objects of this association.

ART. 7. There shall be an annual meeting of the Society at Montpelier, on the day next succeeding the meeting of the legislature, at seven o'clock, P. M., at which time, the President, Vice Presidents, Secretary, Board of Managers, and county committees shall be chosen.

ART. 8. Every freeman of this State is to be considered as having a right of membership in this Society, and entitled to vote in its meetings, and participate in its deliberations.

ART. 9. This constitution may be altered or amended, by a vote of the Society, at any annual meeting.

The report was taken up and acted upon, section by section, and after an animated discussion upon the general subject of Internal Improvement, was unanimously con-

curred in, and the Constitution adopted without amendment.

President, Hon. Silas H. Jennison.

For Vice Presidents.

Wm. C. Bradley,	Timothy Hubbard,
David M. Camp,	William Jarvis,
Benjamin Swift,	Nath'l P. Sawyer,
Wm. A. Palmer,	Richardson Graves,
Lyman Fitch,	Samuel Swift,
M. Chittenden,	George T. Hodges,
Hiland Hall,	Melvin Barnes,
For Secretary	E. P. Walton,
Ass't "	Lucius B. Peck.

For State Central Committee.—J. P. Miller, Dan Carpenter, Araunah Waterman.

For County Committees.

Bennington, Stephen Hinsdale, Isaac Doolittle, Nathan H. Bottom.

Windham, J. C. Holbrook, Phineas White, Henry F. Green.

Rutland, Hannibal Hodges, A. G. Dana, John A. Conant.

Windsor, Francis E. Phelps, Samuel W. Porter, Thomas Emerson.

Orange, Asa Lowe, Hiram Tracy, Thos. Kendrick.

Addison, Samuel Swift, Russell Ballet, Elnathan B. Goddard.

Chittenden, Heman Allen, Henry Bradley, John N. Pomroy.

Washington, Henry F. Janes, Thomas Reed, Jr., Paul Dillingham, Jr.

Caledonia, Erastus Fairbanks, Harry Stevens, Abel Edgell.

Franklin, Homer E. Hubbell, Horace Eaton, Asa O. Aldis.

Essex, John Dewey, Hezekiah M. Wead, Wm. Haywood, Jr.

Orleans, Samuel C. Crafts, Lemuel Richmond, James A. Paddock.

Lamoile, Thomas Waterman, James Tinker, Eliab Herrick.

Grand Isle, Samuel Adams, Hector Adams, John M. Sowles.

This report was accepted, and the nominations of the committe confirmed.

On motion of Hon. Milton Brown Resolved, that all editors of papers in Vermont, friendly to the cause of internal improvement, be requested to publish the foregoing proceedings.

David M. Camp, *Chairman.*
Charles Paine, *Secretary.*

Wabash and Erie Canal.—Eastern termination.—We have been politely furnished with a copy of the order of the Board of Public Works, fixing the location of this canal along the Eastern valley of the Maumee. It has been a question of great interest to the Western speculators, and the precise terms of the arrangement are given.

Ordered, That the Eastern termination of the Wabash and Erie Canal be at such point in the town of Manhatten, or on the public land near the town of Manhatten, on the Maumee river, as the advising Commissioner of that district, the acting Commissioner, and the principal Engineer, having charge of the work, may designate; and that said Canal, from the head of the Rapids of the Maumee river to the Eastern termination of said Canal, be located and constructed on what is called the high level, looking into and connecting with the Maumee river at Maumee city, at Toledo, a Manhatten, and at such other points as may hereafter be determined on.

I enclose you an extract of a letter from the agent of the New-Orleans and Nashville Railroad Company at Nashville. The faith there evinced in the success of the road, contrasts with the want of it in our Legislature not much to our credit. But things are changing, and all things will come right.

You, with other editors of our city, have complained loudly and very justly of the failures of the northern mail; which might lead us to suppose that the western mail is otherwise. I give you some data to judge by: a letter from the company to the agent at Nashville, was mailed the 9th September and received 28th, and his answer of 29th was received 13th, &c. &c. The one from which the extract is taken had better fortune, and came to hand in 12 days.—Now the distance is the same as between Baltimore and Cincinnati, where the mail passes regularly in 4½ days. With such an intercourse in summer, what will it be in winter? And while this evil exists, how vain is it to invite the merchants of those States to seek us at their mart for dry goods, &c. Your line of Liverpool packets will be one link in the chain; but a railroad to Venable the merchant, to come and go without loss of time and convoy his orders, is just as necessary as two links are to make a chain. But our Legislature thought otherwise when they refused $5000 for the surveys of a road. They thought it bettter to pray to Hercules—forgetting that it would require a life time for our mails to convey their prayers. If we wish to escape the fate of the wagoner, we must do it as our Atlantic brethren have done. The city of Baltimore has invested, as a corporation, in the Baltimore and Ohio railroad, 3,500,000. Compare the commerce of the two cities. H.

"I have now to inform you that I have laid before our General Assembly, now in special session, a memorial on behalf of the New-Orleans and Nashville Railroad company, asking a subscription on the part of the State of the stock reserved for her. A bill containing instructions to the Governor to that effect has been introduced by a member, and the whole referred to the internal improvement committee. The success of the application will depend mainly upon the view which the members may ultimately take of the propriety of making appropriations at this (called) session.—[Standard.]

Watertown and Rome Railroad.—William Dewey, Esq., the skilful and efficient engineer, has completed his survey of the route, the estimates of the cost of construction, and has submitted the whole to the commissioners named in the act of incorporation. The Report which is very full and accurate, presents clearly the obstacles to be overcome, the facilities of the route, and the comparative cheapness with which the road may be constructed. We deem the report alike creditable to the Engineer and the commissioners who employed him, as it proves conclusively his capability and their discrimination. The result of his labors and observations cannot but be beneficial to this section of the State, for the great natural advantages with which this country abounds, need only be known to be rightly appreciated. And whether the road is, or is not constructed, this point, to a certain degree, has been secured; the remarks and opinions of men of science and discrimination, will always command the respectful attention of the public. But of the construction of the road, and that shortly, we have no doubt; it is manifestly of such public importance, that its commencement cannot be long delayed.

Mr. Dewey is now engaged in the survey of the Watertown and Cape Vincent, railroad, and will probably be able to make his report this fall. In the mean time his report of the survey of the Watertown and Rome railroad, will immediately be published.—[Eagle and Standard.]

From the London Mechanics' Magazine.

LONDON AND BIRMINGHAM RAILWAY.

REPORT OF THE DIRECTORS TO THE SIXTH HALF YEARLY GENERAL MEETING OF THE PROPRIETORS, HELD AUGUST 5, 1836.

The Directors have the satisfaction to announce to the Proprietors, that the progress of the works generally, in the last six months, has been such as to warrant the expectation which was held out at the last meeting, that the whole line will be completed by the summer 1838, and the first twenty-one miles from London in the spring of 1837.

Of the Primrose Hill Tunnel, which is 1105 yards long, only 114 yards remain to be made; the Kensal Green Tunnel is finished, and traversed by the Company's locomotive engines; 1423 yards are completed of the Watford Tunnel, the total length of which is 1793 yards; and the difficulties which were presented by the quicksand in the Kilby's Tunnel have already been so far surmounted, as to leave no doubt in the mind of the Company's engineer, that they will not delay the opening of the railway beyond the time mentioned. With reference to the other portions of the work, the Directors are making every exertion to forward them, so as to give the Proprietors the benefit of a revenue at the earliest possible period; satisfied that although for the attainment of this object an additional charge will be incurred by the Company, the advantage to be derived from it will be more than commensurate to the expense.

The Directors have entered into a contract, under the guarantee of two responsible sureties, with Mr. Edward Bury, of Liverpool, an able and experienced builder of locomotive engines, for the conveyance of passengers and goods, on the railway, by locomotive power, to whatever extent may be required, at a fixed rate of remuneration; the Company providing engines of Mr. Bury's specification, and Mr. Bury, on his part, maintaining and keeping them in repair; the contract to be in force for three years from the opening of the railway.—The Company have thus assured to themselves the advantage of locomotive power at a uniform and moderate rate, and under a system of management which it is the interest of the contractor to render mutually beneficial to the Company and himself.—

The Directors have also contracted for such locomotive engines as will be first wanted, and for a portion of the carriages.

The Directors in referring to the Bills for railways, connected with the London and Birmingham, which have received the Royal Assent in the present Session, feel themselves called upon to congratulate the Proprietors on the great accession of traffic which they may anticipate from the direct communication opened with the northern and eastern parts of the kingdom, by means of the Midland Counties, North Midland, and Birmingham and Derby Railways, not to mention the connection between Birmingham and Gloucester, by the Birmingham and Gloucester Railway, nor minor lines, which will all contribute to swell the revenue of the Company. Acting upon the suggestion of the Proprietors at the last General Meeting, and considering it desirable that a connexion should be secured with Leamington and Warwick, the Directors have instructed the Company's engineer to ascertain the levels for a branch line to those places, to join the London and Birmingham Railway near Coventry; and they have also set on foot the usual investigation into the traffic, so as to be prepared to follow up the object with such measures as may, in the opinion of the Proprietors, be deemed expedient.

By the statement of accounts now to be laid before the Proprietors, it will appear that

	£	s.	d
The receipts to the 30th June were	1,955,608	0	5
The disbursements . . .	1,492,100	16	8
That the balance in favor of the Company was, at that date . . .	463,507	3	9

And that the amount received on loan, pursuant to the powers given by the last General Meeting, was 443,800*l.*

It is estimated that the liabilities of the Company, for the next six months, will be sufficiently met by the cash at their disposal, and by loans which have been tendered and agreed for, with the addition of calls. Great as the present scale of expenditure will appear, the Directors are satisfied that so long as the works proceed with energy proportioned at that expense, the Proprietors will hail the increase as an additional evidence of the approach of their great undertaking to completion.

RAILROAD TRANSIT AND INLAND NAVIGATION.

(From the Times' Report of First Days's Proceedings of the Bristol Meeting of the British Association, Aug. 22, 1836.)

The subjects arranged for discussion were two—on certain points connected with the theory of locomotive carriages, and on the application of our knowledge of the phenomena of waves to the improvement of the navigation of shallow rivers and canals.

Professor Mosley opened the first poin by stating that there were many gentlemen present acquainted with the practical working of steam engines, but the relations between the theory and practice were not re fectly understood. The piston of a locomotive engine was pressed on either side, one resulting from the friction on the road, and the other from the passive friction of the engine itself. If it was lifted from the ground, a person endeavoring to move the wheels would find a resistance equal to 150 lbs. The cause of the resistance was this—that the traction upon the engine induced additional friction of the machinery, and that probably was one fifth of the whole amount of friction. If the engine moved without a train, there would be a passive resistance; if a train was attached to it, there would be induced a considerable friction of the machinery. There were, in fact, three causes of resistance—the friction of the carriage, the passive resistance, the additional friction by the train—the first and last varying according to the weight of the train. On the other side there was the expansive force of the steam. The quantity of work done was greater as the velocity was less. Inclined planes on railroads he considered to be injurious.

Dr. Lardner said he had given a good deal of evidence before Parliament upon this subject. In all inclined planes more steep than the angle of repose there was an unfavorable loss of power. The portion of mechanical force expended in ascending the plane was not repaid in the descent.—Theoretically they might take advantage of the accumulative matter as a deposit of momentum, and make a perfect mechanical compensation, but that was not the case in practice, because they were obliged to check the velocity in the descent. He had never said, as had been represented, that inclined planes were not of importance, because the friction in the ascent was given back in the descent. When the engine was descending, great part of its steam was going off in the safety-valve, therefore inclined planes were injurious. All the experiments led to the conclusion, that every effort should be made to attain as perfect a level as possible. Every departure from a level, though it saved a quantity of capital in the construction of a road, entailed an everlasting expense. The result of some experiments he had made was this—that in the ordinary state of the roads, the force necessary on a level was 7 lbs., per ton. but he found an extraordinary difference depending on the state of the rails, a difference amounting in some instances to such an extent that the friction was reduced to 4 lbs. When it rained and the rails were wet, he found the friction reduced to 4 lbs., but as soon as the rails became again dry, the friction was again 7 lbs.; he should therefore suggest, that two watering-pots should be placed before the wheels, so as to give the engine an additional power of nearly 50 per cent. There was another point with regard to dust: he had let himself down a very steep inclined plane, and when he attained a speed of 60 miles an hour, he had a quantity of sand put on the rails, and the consequence was, that the steam engine came to a stop.

As to the second subject for discussion—namely, "On the application of our knowledge of the phenonema of waves with a view to the improvement of the navigation of shallow rivers and canals."

Mr. Russell made some very lengthy, but very interesting observations, the substance of which was this,—where canals did exist, there was no man but wished they should be conducted in the most profitable manner. Newton's law had been confirmed, that the resistance was in proportion to the square of the velocity. The difference in the amount of resistance between a vessel drawn on a canal by a horse, trotting or cantering, was from 108 to 136. He would read from a paper the results of various experiments he had made, in which they would perceive a very curious fact as regarded the pace of eight miles an hour,—The table was thus:—

	lbs.
4 miles an hour gave a resistance of	33
6 ditto .. ditto ..	91
7½ ditto .. ditto ..	265
8½ ditto .. ditto ..	215
9 ditto .. ditto ..	235
11 ditto .. ditto ..	246
12 ditto .. ditto ..	352
15 ditto .. ditto ..	444

But at the rate of 20 miles an hour the vessel skated along the surface of the water, and there was scarcely any resistance at all. When a vessel was propelled at a great velocity and then stopped, it produced a wave varying in its form, according to the mass of the water, and he had followed such a wave a mile and a half; the velocity of the wave was uniform, and independent of the velocity of the vessel. If the vessel was going four miles an hour, this wave would go at the rate of eight miles an hour, and he had seen a large wave overtake a small wave and pass it. The waves never exceeded in height the depth of the quiescent water. Vessels at a slow velocity did not divide the water as was generally supposed, but pushed it forward in the shape of a wave; but where the velocity was greater than eight or nine miles an hour, the vessel did divide the water. It was possible to bring the vessel completely upon the wave, and then you had scarcely any resistance. A velocity of between four and six miles an hour on canals was unprofitable; beyond 11 miles an hour you had a high velocity, and comparatively little resistance. He recommended a rectangular canal where it was intended the velocity should be great, as by widening a canal with sloping banks you increased the resisting power.

The Rev. Mr. Whewell agreed with Mr. Russell in nearly all his remarks, which he considered most valuable and important to be considered. It was clearly ascertained that the greater the velocity the less the resistance.

Mr. Russell felt convinced that by adopting a considerable velocity, the Atlantic might easily be crossed with steam-vessels.

The Chairman (the Marquis of Northampton) said, that the observations of Mr. Russell were most important, and that the gratitude of the country was due to him for his experiments.

ARSENIC.—M. Schweiger Seidel has invented a very simple method of ascertaining the presence of arsenic in food, &c.

however small the quantity may be. He puts a portion of the matter to be tried, and double its weight of soda, into a little glass tube; he closes the open extremety of the tube with blotting paper, and heats the other end with a taper: the arsenic is sublimated in a few moments, and adheras to the sides of the tube in the part which is not heated.—[Atheneum.]

CURTIS'S CHIMNEY-HOOD AND ASH-PAN FOR LOCOMOTIVE-ENGINES.

Sir,—I send you a drawing and description of my chimney-hood and ash-pan for locomotive-engines, as used on the London and Greenwich Railway, and shall feel obliged by your insertion of the same in your valuable pages.

The Hood.—The chimney of the engine is covered with a dome, which projects the steam and heated air escaping into the atmosphere upon a surface of water contained in the receiver or outer vessel, so that any sparks or other matter ejected from the chimney must necessarily be received in the water, and consequently extinguished. The condensation of the steam, together with the priming of the boiler, supply sufficient water to keep the bottom of the receiver always covered; and for the purpose of carrying off any excess of water, a small tube is fixed to the bottom of the receiver, and this pipe stands up about $1\frac{3}{4}$ of an inch, so that a plate of water of $1\frac{1}{4}$ inch deep is always ensured. The pipe enters the chimney and forms an elbow, which elbow also is always full of water, so that no fire can possibly pass through it. It is my intention eventually to form the dome double, and to pump up the cold water, which will be thus heated by the waste steam, and then to pump this heated water into the boiler, thus converting the apparatus into a feed head. I find a space all round of about four inches sufficient for the passage of the steam, &c. I have put this invention to the most severe tests I could devise, but could never force a spark from the chimney. The engine runs freer and faster than with the gauge, the draught is unimpaired, the apparatus is cheap and simple, and absolutely safe.

Fig. 1.

Fig. 2.

Description of Engravings.

Fig. 1 is a section, and fig. 2 an elevation of the hood: *a*, chimney; *b*, receiver, containing water; *c*, dome or hood; *d*, bent tube; the curved arrows show the path of the steam, air, &c.

The *ash-pan* is a box of sheet-iron suspended under the fire, and water-tight, so that the water filtering through the fire-box *a* is received into it. The pan is about eight inches deep, and the sides rise above the fire-box about three inches all round, so that the dust in the act of falling is not blown away during the progress of the engine, or by the wind, and being received into water is, of course, immediately extinguished, while the water is evaporised; and the vapor not only prevents the coke from clinkering on the bars, but materially assists the combustion. The box is open all around and behind about eight inches, thus providing abundant aera for the passage of the air to the fire. It is suspended behind by a joint to the framing, and before by a chain which coils round the axle of the hand-wheel *f*, so that when the engineer wishes to discharge the ashes, or rake the fire-bars, he merely lets go the wheel, when the pan falls down, describing the curve shown by the dotted line.

Fig. 3.

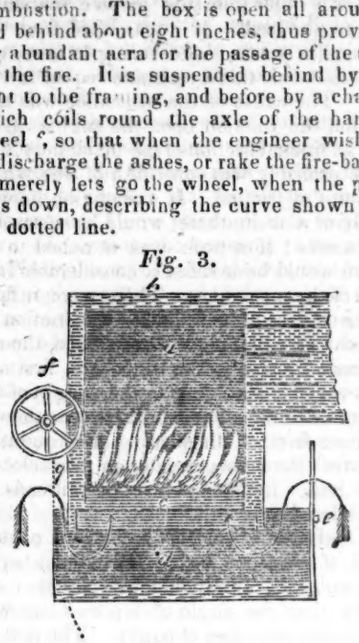
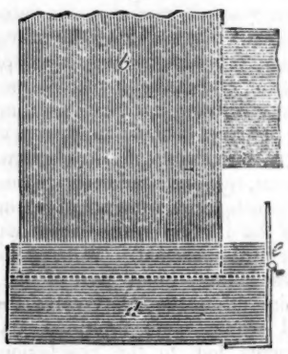


Fig. 4.



Description of Engravings.

Fig. 3 is a section, and fig. 4 an elevation of ash-pan and part of the boiler: *a* fire-box; *b*, boiler; *c*, fire-bars; *d*, ash pan, containing water; *e*, hinge of ditto; *f*, hand-wheel; *g*, chain by which the pan is suspended. The curved arrows indicate the path of the air.

Your most obedient servant,
W. S. Curtis.

Deptford, August 6, 1836.

APPLICATIONS OF CHEMISTRY TO THE USEFUL ARTS, BEING THE SUBSTANCE OF A COURSE OF LECTURES DELIVERED IN COLUMBIA COLLEGE, NEW-YORK, BY JAMES RENWICK, PROFESSOR OF NATURAL EXPERIMENTAL PHILOSOPHY, AND CHEMISTRY.

VII.

USEFUL APPLICATIONS OF THE EARTHS.

1. LIME.

PREPARATION OF QUICK LIME.

Authorities—Dumas. Chimie appliqué aux Arts.
Biston Manuel du Chanfournier

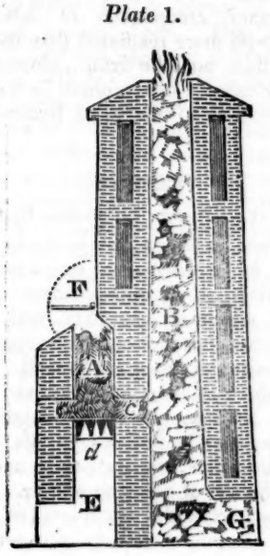
Under the general name of limestones are comprehended all mineral substances which contain not less than half their weight of carbonate of lime. Quick lime is prepared from most of these limestones, by calcination, and is characterized by the property of absorbing water with phenomena of heat, an action which, if it also cause the lime to fall to powder, is called slaking. Lime prepared from different varieties of limestone has different properties in this respect. In some cases the action is rapid and violent, the heat produced, great; in others the operation is more slow, and the heat less intense. There are also, limestones which after calcination will not slake. The limestones which are richest in carbonate of lime belong to the first variety; those which contain carbonate of magnesia in a proportion greater than 10 per cent. to the second; while the resistance to the action of slaking in the third is due to the presence of argillaceous matter. The two first varieties are alone suited to the preparation of mortar. The last variety will not make mortar in the usual manner, but is nevertheless of great value as an ingredient in cements which will resist the action of water. In the act of slaking, quick lime, which retains after calcination the shape and structure of the limestone whence it is prepared, falls, as has been stated, to fine powder. It also falls to powder after exposure to the air, when it is said to be air slacked. In the first case the lime combines with water forming a solid hydrate; in the latter it absorbs carbonic acid from the atmosphere, and returns to the same chemical state which the limestone possessed before calcination.

The calcination, or, as it is usually styled *burning* of lime, is performed in chambers built of stone, which go by the name of kilns. Of these there are two descriptions, ordinary and perpetual. The ordinary lime kiln is of the shape of a truncated cone, or of a portion of an ellipsoid. The limestone is prepared for calcination by breaking it into pieces none of which have a greater dimension than 3 or 4 in. cube. The larger fragments of limestone are employed in building a rude vault, over a cavity left in the lower part of the kiln. To this cavity an entrance or door is left in the wall of the kiln. The rest of the kiln is filled up with smaller pieces. When wood is used as fuel, it is introduced by the door into the space beneath the vault and is burnt on the floor of the kiln. When coal or turf are employed, an iron grate is provided, on which the fuel is placed, leaving an ash-pit beneath. In building the vault, the spaces between the stones are left of as great an area as possible, and in filling the kiln the largest of the remaining pieces are laid next to the vault, while the smallest fragments are used for covering the rest, and closing the top of the kiln.

The fire is at first moderate, in order that the limestone may be gradually heated. After 10 or 12 hours the quantity of fuel is gradually increased, until the mass of limestone is brought nearly to a white heat. After it has been kept for some hours at this temperature, the bulk of the mass of limestone decreases about one sixth, and flame issues almost free from smoke, from the top of the kiln. The intensity of the heat is then gradually diminished until the fire is permitted to extingush itself, for

want of fuel. In order to complete the calcination of a given bulk of limestone in an ordinary kiln, nearly three times its volume of wood, or twice its volume of turf or coal is required. Much of this quantity of fuel is consumed in the gradual heating of the limestone and in preventing it from cooling too rapidly after the calcination is complete. It is therefore obvious that in a kiln in which the operation might be kept up without ceasing, a considerable saving of fuel might be ensured. Such a kiln is said to be perpetual. The first attempt at the construction of a perpetual kiln was made by Count Rumford. Its construction and use will be understood from the annexed plate. Pl. 1.

Plate 1.



A. Furnace
B. Body of the kiln.
C. Flue by which the flame and heated air passes from the furnace to the kiln.
d. Grate.
E. Ash-pit.
F. Iron Door.
G. Opening by which the lime is removed.

The furnace being charged with fuel and lighted, the door F, and the mouth of the ash-pit are left open until the fuel is ignited. The mouth of the ash-pit is then closed, and a draught will be directed downwards through the fuel into the body of the kiln, and carry the smoke, flame, and heated air through the limestone which it contains. That which is completely calcined is removed at the opening G, and its place supplied by limestone thrown in at the top of the kiln. In consequence of the air being drawn downwards through the burning fuel, the smoke is almost wholly consumed.

An improvement in the kiln of Rumford was made by Monteith of Closeburn in Scotland, but although more effectual and convenient, the cost of its construction would forbid its being brought into common use.

The consumption of the smoke, which is the distinctive character of these two kilns, is of little value in this case. Hence, various kilns have been contrived in which the draught of the fire places is not inverted, and these are placed in the circumference of a circle round the body of the kiln. It is unnecessary to describe the kilns of this character, for a far simpler form has been found sufficient, wherever coal or turf can be employed as a fuel. The kiln to which we refer has the form of an inverted truncated cone whose height is twice as great as the diameter of its greater base. A few faggots or billets of wood are placed in the bottom of such a kiln, and set on fire. These are covered with coal, and when the latter is fully ignited, the kiln is charged with alternate layers of limestone and coal, until it is filled to the top. The combustion gradually extends itself through the several beds of coal. When the calcination is completed, two thirds of the charge are withdrawn from the lower part of the kiln, which is then filled up with fresh layers of limestone and coal. In this way the consumption of coal does not exceed one fourth of the bulk of the limestone calcined. Fuel also of a very inferior description will answer the purpose of lime burning in the last mentioned kiln, as, for instance, the refuse cinders of bituminous coal, and the screenings of anthracite. A kiln of this construction is represented pl. 2.

Plate 2.

Fig. 1.

Fig. 2.

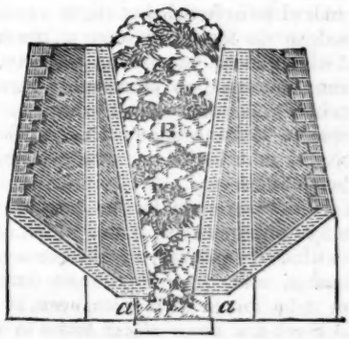


Fig. 1 is a ground plan, fig. 2 a section
B. Body of the kiln.
a, *a*, *a* opening through which the lime is received.

PREPARATION AND USES OF MORTAR.

Rationale.—When the hydrate obtained by slacking quicklime is mixed with water to the consistenee of paste, a small portion of the lime is dissolved; the dissolved lime attracts carbonic acid from the atmosphere and is precipitated upon that which remains undissolved, the water is thus left free to dissolve a new porton of the lime which is in its turn precipitated, and this successive action will be continued so long as moisture is present, or any portion of quicklime remains. The cessation of the action arises more usually from the loss of moisture by evaporation, than from the complete solution of the quicklime. A portion of the latter therefore remains, which is gradually converted into carbonate, and thus the semiliquid paste is gradually converted into a white solid possessing but little adhesion. If silica be mixed with the lime and water, the precipitation of the carbonate takes place upon it in preference, and the adhesion between them is stronger than in the former instance. Indeed, it appears as if the chemical affinity which exists between lime and silica influences the adhesion, and that the conversion of the carbonate into silicate of lime begins, and continues to go on for ages. It is only in this way that we can account for the long series of years which elapses before mortar attains its limit of hardness, and a force of aggregation often superior to that of the limestone whence it is made. The theory of the formation of a silicate of lime is also corroborated by the act, that even in the most ancient and hardest mortars, the quantity of carbonic acid which is present is always less than would be required to convert the lime into carbonate. For the same reason that the adhesion of the precipitated carbonate of lime to silica is greater than to other portions of lime or carbonate, the adhesion of mortar to brick or siliceous stones is greater than to limestone. It is however necessary in all cases that the stone or other material which is to be laid in the mortar be moist, or at least do not absorb moisture. If the material absorb water from the mortar, the solution and precipitation no longer take place, and no adhesion will ensue between the mortar and the stone. In laying brick, therefore, it is necessary that it be wet before the mortar is applied, otherwise no bond will take place,

Preparation.—The lime intended for the manufacture of mortar should be either recently burnt, or should have been carefully preserved from the action of air.

Lime which has been long slaked will make as good mortar as recent quicklime, provided the latter condition have been attended to, but as it is more difficult to judge of the freedom from carbonic acid in slaked than in quicklime, it is considered preferable to use the latter rather than the former.

When the lime is prepared from a stone which is free from impurities, it slakes readily, and may be converted into mortar as the art of slaking is going forward. For this purpose, a sort of basin is formed on the ground, by means of the sand intended to enter into the composition of the mortar. The lime is thrown into the middle of this basin, and water gradually poured over it. The quantity of water must be sufficient not merely to form the solid hydrate, but to convert it into the mechanical mixture known as the milk of lime. As the quicklime falls to powder, it is gradually incorporated with the sand and water by means of a hoe, which is also of use in breaking down those parts of the lime which longest resist the action of the water.

If the lime be combined with magnesia, it slakes too slowly to permit this method to be employed. Such lime should be placed in a conical pit, water thrown upon it, and

then covered up with the sand intended to be mixed with it. Days, or even weeks may elapse, before the whole mass shall have fallen to powder, but after the disintegration is complete, such lime will make as good a mortar as that prepared from a pure carbonate. It is more usual to slake such lime in the neighborhood of the kiln, and to separate the parts which have not fallen to powder by means of a screen, but this method is objectionable, as the finer and richer portions are liable to be charged with carbonic acid before they can be transported to the place where the mortar is to be prepared. A method which is preferable to either consists in plunging the magnesian lime into a vessel of water, where it is permitted to remain until completely pulverised. The excess of water is then drawn off, and the lime with the residue of water incorporated with sand. The sand which is to be used in making mortar, ought to be made up of angular fragments of quartz. Such sand is found in the bed of running streams, or in diluvial and alluvial deposites from running water. It is designated by masons by the epithet sharp. A mixture of argillaceous matter deprives it of this quality, but as this may be separated by agitation with water, the necessary sharpness may often be acquired by washing the sand.

For laying brick or well jointed stone, fine sand is to be preferred; for common hewn stone, sand of coarser grain; and for rubble work, the mortar made with coarse sand should be mixed with small pebbles, or rather with angular fragments of a siliceous stone.

The best proportion of the materials of mortars, is one part of a pure quick lime to three of fine or four of coarse sand. If the lime be of less purity, the quantity of sand must be lessened in such manner as to bear the same proportion to the pure earth contained in the limestone.

The rapidity with which mortar sets may be much increased by the use of quicklime, ground to powder, instead of being reduced to that form by slaking. This method is the invention of Loriot, a French engineer, who supposed he had discovered the secret of the hardness of the ancient mortars. He directs that three parts of slacked lime be mixed with four of water, and that sixteen parts of pulverised brick or sand be added. After these materials are thoroughly mixed one part of quicklime ground to fine powder is to be added. This mortar has not all the valuable properties which were anticipated by its inventor. It might however, be used to advantage in building in frosty weather.

Limestones which contain silicoous or argillaceous matter are fit for the preparation of mortar, so long as the lime prepared from them retains the property of slaking, but the proportion of sand with which they can be mixed must be still further lessened by the bulk of the other earths contained in the limestone.

HYDRAULIC CEMENT.

History.—The ancients were acquainted with a substance which, when mixed with a pure quicklime and water, formed a mixture that possessed the property of hardening under water. This is a volcanic product having the form of powder, originally found at Puteoli in the neighborhood of Vesuvius, and called from the locality *Terra Puteolana.* The material is still used on the shores of the Mediterranean and is called Puzzolana

The wants of the people of the Low countries led them to seek in their own vicinity for a substitute for Puzzolana. This was found in a rock furnished by extinct volcanoes, whose traces are to be seen on the banks of the Rhine. This differs from Puzzolana in requiring a calcination to prepare it for use, and when calcined it absorbs moisture so readily that it must be carefully preserved from contact with the air, unless it be used within a short time of its manufacture. During the sixty years war, the people of Holland were cut off from a supply of this important article. In order to replace it, earth was drawn up from bottoms of their canals, formed into brick, burnt, and pulverized. This article was found to be nearly as efficacious as the native product, and both go by the common name of Terras or Trass.

Not only is there a substance which when mixed with pure lime makes an hydraulic cement, but these are varieties of limestone, which are characterized by refusing to slake when water is poured upon them, that when mixed with sand have the same valuable property. The discovery of this property seems to have been accidental and its date unknown. Such limestones were first worked at Aberthaw in England, and Salenches in France. When the construction of the New-York Canals was commenced, such limestones were found in its vicinity, and since that period quarries of the same description have been opened in various parts of the United States. It may indeed be imferred that there is hardly any calcareous formation some of the layers of which do not possess this property.

Even where native puzzolana, Terras, or an hydraulic lime are all wanting, the example of Holland shows that artificial substitutes may be found wherever clay can be obtained.

Of all the materials for the preparation of an hydranlic cement, those which contain within themselves all the necessary substances, and thus require no foreign matter to be mixed with them, seem to be best. Such are the septariæ found in the London Clay and used in the preparation of "Roman cement."

Rationale. If the scale of a smiths forge, or the black oxide of iron in any other form, is mixed with common mortar, it acquires the property of setting more rapidly, and speedily becomes so hard as to resist the action of watar. Clays rich in ferruginous matter, if burnt and reduced to powder, have the same effect upon lime. It was also found that the native Terras contained from 10 to 15 per cent. of oxide of iron. It was inferred from these facts, that the property possessed by a cement of setting in water, was due to the presence of oxide of iron. Some of the most valuable hydraulic limes however, contain little or no iron, and Puzzolana is also poor in that substance. An isolated observation subsequently led to the ascription of the hydraulic property to the presence of oxide of manganese. Another view of the subject led to the hypothesis that hydraulic cement was obtained from a sub-carbonate of lime, the limestones from which it was prepared being in such a state of combination that heat could not expel more than half their carbonic acid. The theory which is now received is that of Vicat, who infers that hydraulic cement is obtained, whenever a silicate of lime is either formed in the calcination of the limestone, or generated rapidly by the action of the substances with which a pure lime is mixed. This silicate has the property of combining readily with water, and then the aqueous part of the cement speedily becomes solid. To this we may add that the ternary compounds of silica are formed with more readiness than the binary, and thus metallic oxides, alumina, and probably other earths concur in hastening the formation of the solid hydrated silicates.

PUZZOLANA.

Authority.—Belidor. Architecture Hydraulique.

Hydraulic cement may be made of puzzolana, by mixing nine measures of a pure quicklime, or an equivalent quantity of that which is less pure, with water, and twelve measures of puzzolana, and six measures of good sharp sand. If the place where it is to be employed in the erection of masonry is so situated that the stones may be laid above the level of water, no other preparation is necessary than in the use of common mortar. If it is to be used below the usual level of a mass of water, a coffer dam may be constructed. This is a case formed of piles and pile-plank driven into the bed of the mass of water, in such manner as to resist its passage. After the coffer dam is finished, the water inclosed within it is raised by a pump, or other appropriate hydraulic engine, and the work is performed, after the water is thus discharged, precisely as if it were common masonry. When the bed is level, or can be rendered so, a caisson may be employed. This is a water-tight vessel whose bottom is flat, and whose sides are vertical. It is made large enough to contain the proposed structure and at the same time have room for the workmen and necessary scaffolding. The caisson is buoyant, and floats at the surface of the water. The building materials are introduced into it, and covered up in regular courses from its bottom. As the work advances the caisson sinks, until it rests upon the bed. After the structure has been raised above the level of the surface of the water, the sides of the caisson may be removed, but the timber bottom remains as a foundation for the masonry. Stone may also be laid in hydraulic cement beneath the surface of a mass of water by means of the diving bell.

A more rapid mode of construction was employed by the ancients, and is still used in the ports of the Mediterranean. Instead of a tight coffer dam, a mere inclosure of woodwork is formed in the water, inclosing a space of the figure of the contemplated structure. To 27 measures of hydraulic

cement, made as has just been described, 16 measures of pebbles or chip stone are added, and the whole incorporated by stirring it for an hour, either with a hoe in the hands of a workman, or by the aid of machinery. The mixture is then formed into a conoidal heap, and allowed to remain at rest until a hard crust is formed on its surface. This will happen in warm dry weather in five or six hours, but in moist weather, some days may elapse before the cement acquires a proper degree of consistence. The mass is then broken up by the pickaxe, and intimately mixed for the second time by agitation. No water need be added to the mass, but it will regain its fluidity by stirring. When the water in which the structure is to be built is deep, the mixture is plunged into it by means of a wooden case of cubical shape. This is managed by means of a windlass moveable upon a railroad, and has a sliding bottom, or a shutter fastened by hinges. When this has been lowered until no more space is left than just suffices for the opening of the shutter, the latter is permitted to open, and the cement falls to the bottom. A second case full is lowered and deposited beside this, and the surface of the two masses leveled by rakes and other appropriate instruments. When a uniform bed, of about a foot in thickness over the bottom of the whole space inclosed by the wooden partition has been thus deposited and spread, blocks of stone of not more than eight inches cube are thrown upon the cement, until an entire layer of such stones has been spread over the cement, in which they are capable of partially embedding themselves by their own weight. Upon these a second layer of cement is spread by means of the case, which is followed by a second layer of stones, and thus the level of the surface of the water is reached. The case however becomes uesless when the depth of water is less than twice the vertical dimension of the case. After the structure has been raised thus high, the cement is thrown in by baskets and hods, and the last courses may even be laid by the trowel.

In Europe, the wood which encloses this structure is usually removed, and may be employed again for the same purpose, but when wood is abundant, it would probably be better to leave it as a protection to the structure, until it decays, when the masonry will probably be perfectly consolidated.

Terras both native and artificial may be used in the same way. So also may the powder of burnt clay or brick, of calcined ochre, and roasted clay slate.

Terras is prepared from a columnar greenstone or trap rock found near Andernach on the banks of the Rhine. This is roasted and reduced to powder. A similar stone is found on the bank of the Hudson near Fort Lee, and might no doubt be used for the same purpose. Other varieties of trap rock or basalt may be prepared for a similar use, by heating them until they begin to fuse, and grinding them to powder.

Hydraulic Lime.—Hydraulic lime is calcined in the same manner as common limestone. It is prepared by grinding it in a mill to a fine powder, and ought to be kept for use in tight casks. Any limestone which contains from 9 to 10 per cent. of argillaceous matter is slightly hydraulic, and it possesses this property in perfection when the proportion of that compound amounts to 20 or 30 per cent.

An artificial cement may be prepared by mixing 3 parts of chalk with one of clay, tempering the mixture with water, forming it into bricks, calcining, and grinding to powder. Care must be taken, that, while the heat must be sufficiently intense not only to drive off the carbonic acid from the chalk, but also the last portion of water from the clay, the mixture does not begin to fuse, for, after this stage is reached, the hydrate can no longer be formed.

It was long supposed that the hydraulic limes and artificial cement could not be used in building in a mass of water, by throwing in loose stones upon a bed of cement mixed with chip stone, as described under the head of puzzolana. But recent experiments in France have shown that this idea is unfounded, and that the hydraulic limes mixed with common sand, have all the properties of the cements of which puzzolana or terras form a portion. It is necessary however, to examine experimentally the length of time which they take to set beneath the surface of the water, for this will differ with the different varieties of the natural mineral; and where the rate of setting is not such as to render the mixture hard within a few hours, the mixed cement and chip stone must be allowed to lie in heaps until it becomes hard at the surface, before it is plunged into the water.

Roman Cement.—This celebrated article is prepared in England from a stone found in nodules in the geological formation called the London clay. It is a compact substance of a brown color, susceptible of high polish. It is usually divided into irregular masses by veins of crystalized carbonate of lime. The quantity of silica and alumina contained in the brown portion is sufficient to form the cement without any further addition, when it is to be used beneath the surface of water. When thus unmixed it will set, either in the open air or in contact with water, in not more than fifteen minutes. Its properties in the two cases are however different, for it does not, if used unmixed, increase in hardness after it has once set, when merely exposed to the air; but if immersed in water, or in a damp position, it gradually acquires the firmness of the strongest native limestone. It should therefore never be employed pure, except when it is to be exposed to the action of water. Where it is used merely in a moist place, two parts of good sharp sand should be mixed with three of cement; if in a position exposed to frost, three parts of sand to two of cement; while in a dry and warm climate or in covering walls exposed to the sun, at least five parts of sand should be mixed with two of cement. It is probably owing to the Roman cement, when applied as a stucco, having been used pure, and laid upon dry brick, that its use has been attended with little success in this country, or when properly prepared and applied, it has borne equally well the extreme climate of Canada, and the torrid air of the West Indies. Its use also requires an experienced workman. When it is to be mixed with sand, the two materials must be thoroughly incorporated before water is added.

A stone, identical to that which the Roman cement is prepared, has been found at Boulogne, in France, and one similar in texture, and in being veined with carbonate of lime, at Cumberland in Maryland. The poor calcareous ores of iron, found in coal formations, have also been used in preparing a cement, which has all the properties of the Roman, and goes by the same name. The material whence Roman cement is prepared has also been used in England in the preparation of artificial stone. For this purpose the cement while still liquid is poured into moulds having the figure of architectural ornaments. A similar use has recently been made of the American hydraulic cements, under the sanction of a patent.

USE OF LIME IN AGRICULTURE.

(*a*) There are certain soils which contain inert animal or vegetable matter, which being insoluble is unfit for the food of plants. Quicklime has the property of hastening the putrefactive process, and will thus, by disposing the inert matter to enter into fermentation, render it capable of supporting the growth of plants.

(*b*) Some soils are charged with a small quantity of acid matter, which interferes with vegetation, except that of a few useless plants. This acid may be neutralized by lime, which may either be applied in the state of quicklime or of carbonate.

(*c*) Sandy soils may be barren in consequence of the rapidity with which moisture escapes from them; and clay soil in consequence of its forming tough clods in dry weather, and being too retentive of moisture. Both of these opposite defects may be remedied by lime, for this earth renders the toughest clay friable, and causes sand to be more retentive of moisture. Quicklime will act most powerfully in both these cases, but the carbonate is not inefficient.

(*f*) The seeds of the cereal granima all contain lime in combination with acids. Their stalks also contain it, but in less proportion. Wheat is the grain which contains most of this earth. Hence none of these valuable vegetables will flourish except in soils which contain lime, and some soils which are fertile in grass, may be incapable of bearing grain; or those which yield a tolerable product of the less valuable grains, may refuse to bear wheat. As the lime enters into the constitution of the plants, the calcareous matter of the soil will be gradually exhausted, and hence it has been found that even under careful management, wheat has gradually ceased to be a profitable crop in the older parts of the United States. Animal manures contain the phosphate of lime, and thus convey to the soil some of this earth, but not in quantities sufficient to maintain a soil in condition for wheat. Carbonate of lime ought therefore to be applied from time to time, or slacked lime spread upon the ground, and ploughed in, after it has attracted carbonic acid from the air.

(g) Lime and its carbonate have also the property of condensing the gases which arise from putrefying vegetable and animal substances, and of combining with other products of their decomposition. Hence the native fertility of calcareous soils will continue much longer than that of other descriptions, and the effects of vegetable and animal manures will be more permanent if applied to a soil containing lime, or in combination with that earth or its carbonate.

In England and Scotland, as much as 400 bushels of slacked lime have been advantageously applied to clay soils, and 200 bushels to sands. In this country the use of lime has been chiefly confined to the farmers of German origin, in Pennsylvania, and their descendants in other States. The proportion has rarely exceeded 40 bushels per acre; but while in England the effect of the larger quantity lasts for more than the life of man, the less quantity in America is renewed as a preparation for every wheat crop.

The best mode of applying lime is that practised in La Sarthe, (France.) Here, slacked lime, in the proportion of no more than 12 bushels per acre, is made into a compost with sods.

Pulverized limestone may be used for most of the purposes for which slacked lime is applied, for, except when it is wished to promote the decomposition of inert organic matter, or to render a clay soil speedily friable, the caustic earth is unnecessary, and occasionally injurious; but it is generally cheaper to reduce limestone to powder by calcination and slacking than by mechanical means. In Europe, however, chalk is used as a manure.

The true marl, or mixture of carbonate of lime and clay, is also a valuable manure, as are the shells found in the green sands of the seaboard of the United States, which are improperly termed marls.

The magnesian limestones ought, if calcined, to be applied with great caution, as magnesia when deprived of carbonic acid is destructive of vegetation, and as it attracts that acid from the atmosphere much less rapidly than lime does. In small quantities, however, or if exposed until the whole of the magnesia has been carbonated, the magnesian limestones yield a valuable manure.

Lime, even if pure, must be applied with caution to soils which have never before been subjected to its action. The dose may be increased at each successive application, and it is more efficacious, and may be applied in greater quantities, when animal or vegetable manure is used at the same time. But it must not be mixed previously with stable or barn-yard manure, as much of the value of that substance will be destroyed by the rapid decomposition induced by lime. This rule does not apply to carbonate of lime, and therefore marl, in particular, may be mixed to great advantage with dung-hills, and used to form a bed in barn-yards, for the purpose of absorbing liquid manure, and the gases generated in the putrefaction of the litter.

Agrienlture, &c.

From the Baltimore American.

Culture of Tea.

We find in the last number of the Western Review the fullest and most interesting account we have ever met with, of the nature and culture of tea, a commodity which forms the chief bond of connexion between the empire of China, with its population of 350 millions and the rest of the world.

The tea plant is a bushy evergreen shrub, which, if permit ed to attain its natural size will grow to the height of 12 feet In botany it constitutes by itself a distinct genus, of it there is but a single species, the plants yielding the different kinds of black and green teas, being in reality no more than permanent varieties, the result of long culture. The plant has been cultivated in China from time immemorial. The latitudes in which it thrives best are from 23 to 30 north. Like the vine it is cultivated on the sides of hills in preference to plains. It is raised from the seed, and yields its crop in from two to three years.

When the best teas are raised, the plant is carefully pruned and prevented from attaining a height exceeding two or three feet. The production of good tea depends upon soil, locality and season, full as much as that of good wine; like it, too, the produce varies according to the care with which the crop is collected and prepared for use. From the same plant, are commonly taken in each season four crops; which is another cause of variety in tea as it appears in market. The younger are the leaves the higher is the flavor. The earliest crop is taken in the beginning of spring, and the last in August.

The growth of teas of sufficiently high flavor to keep for considerable time, and fit in consequence for exportation, was for a long time confined to two provinces—Fokein, that yielded black tea, and Kiangnan, which yielded green tea. Of late years owing to the great demand for teas in Europe and America, the culture has been extended to three additional provinces. The two original provinces, however produce the best; the worst comes from Woping in Canton.

In China, contrary to the usage of the other great despotism of Asia, the soil is private property, and is very minutely subdivided The leaves of the tea plant are picked by the cultivator's family, and conveyed at once in a fresh state to the market, where they are purchased by a particular class of dealers, who dry them under a shed, and in this imperfect state of preparation dispose of them to a second and higher class of traders, who sort the teas according to their qualities, and after completing the process of manufacture, pack them in chests. The tea arrives in Canton about the middle of October, and the business period of the trade exists from that time to the end of December. The traders in green tea amount in number to about four hundred; the dealers in black are less numerous but more wealthy. They accompany their chests, carried mostly by porters from distances of several hundred miles to Canton. In Canton the sorts quoted for export do not exceed fifteen in number, about eight of which are black and six green, the prices varying from twelve to sixty cents a pound.

In regard to consumption of tea in different countries, the writer remarks that all the nations of Asia, east of Siam and Camboja, are what may be termed habitual and immemorial consumers of tea. With the Chinese themselves, the teapot is in constant requisition from morning until night with persons of both sexes, of all ages, and all conditions. They use it always without milk, frequently without sugar. Supposing—what is a very reasonable supposition—that each inhabitant on an average, drinks twice as much as each inhabitant of Great Britain, the annual consumption in China would be half a million of tons.

The use of tea in Europe commenced about one hundred and eighty years ago, and in this time the consumption has raised from a nameless fraction to nearly thirty thousand tons. A greater quantity is consumed in Great Britain than in all the rest of Europe and America.

Recipe to Cure Pork Hams.

By E. Foote.

7 pounds salt,
3 ozs. salt peter,
6 red peppers,
4 gallons water.

Make a pickle according to these proportions, sufficient to cover your hams well, by putting the salt, saltpeter and peppers, into the water, till the salt is nearly dissolved. Pack your hams in a barrel or other vessel, and pour your pickle on them, stirring it well at the time that the undissolved salt may be all poured to your hams. Be careful that they be all covered with the pickle, and kept so for six weeks; then take them out and wash or rinze them off in clear *clean cold* water, hang them up and let them drain for a day or two, then smoke them with sugar maple or hickory chips or wood green from the tree, which makes the purest and sweetest smoke of any kind of wood I am acquainted with, and makes it entirely unnecessary to put sugar and molasses in the pickle, as I used to do.

My method of smoking is, if in moderate fall or winter weather, to make one smoke in twenty-four hours—if in severe winter weather, two. The object to be aimed at in regulating the smoke is, first, to make as little fire as you can, and make a good strong smoke—second, to let your hams get thoroughly cooled through after each smoke before another is made. Every farmer who uses an axe, knows how rapidly a cold frosty axe collects pyroligeneous acid, or escence of smoke. While hams are cold they collect it as rapidly, and as they become warm it dries into them. If you increase the heat so as to make them drip the fat, you lessen the weight of your hams and injure their flavor. With regard to the credit of my hams in market I will only say, that gentlemen in Cleveland, who have used hams of my curing, pronounce them equal to any they have ever seen, and they command the highest price in market.—[Ind. Far.]

Brooklyn, Ohio, Sept. 1836.

The following flash of humor is from the proceedings of the Worcester County Agricultural Society.

The committee were called upon to discharge a duty, which was much to their taste, in testing some Wine—not old madeira made of whiskey, nor Old Port dyed with logwood, nor sparkling champaigne fresh from the cider cask, but genuine, unadulterated, home-made Wine, made

without the admixture of alchohol, from the currents of the garden of Newell Nelson, Esq. of Milford.

The committee did not find time to discuss the question of temperance in its bearing upon this article, but did from time to time find opportunity to discuss this Wine quite freely and after repeated tests and tastes, they are unanimously of opinion, that current wine of Mr. Nelson was truly a " current" article, and if old Milford wine be not as fashionable, it is as palatable as old Madeira. They therefore recommend that a gratuity of $3 be given to Mr. Nelson for his Milford Wine.

All which is respectfully submitted,

C. C. P. HASTINGS, *Chairman.*

SWINE.

[There is Attic Salt enough in the following to pickle all the pork in the County of Worcester.]

The committee on Swine, under the peculiar circumstances of the occasion, beg leave to report chronologically.

At a very respectable meeting of their body, duly notified to be held this morning, at nine o'clock, in the area between the pens, it was found that the Committee was not to be found. One person and one pig only answered to their names on the call of the house. It seemed that there would be nothing to do, and nobody to do it. The solitary grandeur of the situation became oppressive of its sublimity. The chairman conceived that he was in a delicate condition of perplexity. The responsible duties of his elevated official station pressed heavily on the one hand, while on the other, the laws of the society prohibited him from having any opinions of his own, or voting, except in case of division. Of the constitutionality of such enactment doubts might have been entertained: but the scruples which arose, were more entertaining than useful, as nullification was out of the question. The wind from down East blew as coldly as if it had been made from the ghosts of the pine logs described in the specifications of proprietors of Maine townships, or had passed over the consciences of traders in timber lands: and with it came water enough to wash anything but a solid conscience clean. After serious consideration, the chairman solemnly declared to his sole coadjutor, in the language sanctioned by high authority, "our sufferings is intolerable," and made application to the Trustees for relief. By their order, *volunteers* were *impressed*, and five good men and true, selected with reference to excellence of taste and looks, were *compelled* to come in *freely*, to assist in the arduous labors of the day. A most judicious committee having been thus constituted, the multitude of swine rapidly increased, and business advanced prosperously to its consumation.

One boar only graced the anniversary by his presence. The certificate of his owner testified that he possessed every excellence, except good moral character, of which nothing was said. Although much diversity of opinion could not be expected to arise in the plentiful lack of competition, yet the committee considered it dignified to proceed with great deliberation. The only fault they could detect, on careful inspection of this candidate for the honors of the society, was, that like the dog described by Washington Irving, his tail appeared to be curled so tight as to lift his hind feet from the ground. As no reasonable doubt could be entertained, that, on the suggestion of the difficulty, some ingenious inventor would obtain a patent for a machine to straighten such crooks, the committee unanimously awarded *Five Dollars* to the Hon. John W. Lincoln, for this the greatest and best boar they saw.

A fine company of sixteen noble swine had arrived from jail, and were placed in one pen by Mr. John F. Clark. One of them appeared to have been converted by the scarcity of corn to the doctrines of Dr. Graham, the gentleman who, by the practice of his own principles of health, might expect, as the survivors of mortality, at a venerable old age, to be able to write the life of Death. Standing by the fence, and inviting his companions to gnaw their dinner from the society's new chesnut rails, this creature, like the sincere disciple of an illustrious master, contented himself with earnest exhortations to others to reform their luxurious diet without himself partaking of the frugal fare. A breeding sow, attended by one generation of three children, and another of nine, was exhibited by Mr. Clark. This fair image of female loveliness afforded evidence that the phenomena of the science of animal magnetism are not confined to the beauties of Boston. On being struck with the top of an umbrella she fell into a state of somnambulism, like that of a lady whose case has been reported in the newspapers. Lying with closed eyes, consciousness of the approach of the stick was manifested, and strong dissent expressed at renewed applications of the magnetic power. While in this abstracted condition, several questions were proposed, but strange as it may seem, no answers were returned. The committee were of the opinion that the first premium of *five dollars* for the best breeding sow should be given to Mr. Clark. They regretted to see in animals subject to the good discipline of that gentleman, some indications of a contentious disposition and want of sedate behaviour, and recommend that they be sent to the House of Correction, for such term as the improvement of their manners may seem to the keeper, their owner to require.

A breeding sow, with a round dozen of very round and neat little pigs, was exhibited by Mr. Thomas T. Farnsworth. The accomplishments of the mother of this small and interesting family deserved, in the opinion of the committee, the premium of *three dollars.*

"The best weaned pigs not less than four in number" were not offered by any person.

In concluding the detail of their doings, the committee feel it to be their duty to remark that a solemn crisis in the affairs of swine is impending. When corn has been frozen and potatoes parched, when the deposites of the granaries have been removed, and the desolated fields yield no surplus, the inquiry rises with startling force what can the pigs do? It comes home to the pot and plate of every lover of his country. Our lands, our liberties, our wives, our children are dear, and pork is dear also, and grows dearer day by day. The subject is one of vast relations. Where would be patriotism without pork? Where virtue, where valor, where ancient faith, where modern degeneracy, without swine? The soul of honor cannot be sustained without the body of bacon. The lamp of love would burn dim without spareribs. The very face of fashion would grow rough without bristles to beautify its smoothness.

But although the prospects of the race have been gloomy as the clouded heavens, that constancy and unconquerable resolution, alluded to by the President, have been found still in the pens. The spirit of the Pilgrims' pigs still animated their successors. Beneath the stormy clouds the committee have heard no swine swear, they have seen none elevating their spirits by depressing other spirits, none stooping to smoke long nines or chew pig tail. There has been no unswinish repining at the allotments of Providence. The only boar of the festival was noticed to wipe his eyes with his fore foot instead of a pocket handkerchief, as if in tears; but it was ascertained that he was only brushing away the rain drops. Such firmness in wet and affliction deserves the wish that it may be rewarded by sleeping many a long summer day in all the luxury of mud, with the soft green earth beneath, and bright blue sky above.

All which is, as much more might be, most respectfully submitted.

WILLIAM LINCOLN, *Chairman.*

From the Gennesee Farmer.

VALUABLE PROPERTY OF THE LOCUST.

It has long been known that for ordinary purposes, and in the most exposed situations, the wood of the locust tree was more durable, and of course valuable, than any other, where strength and durability were the main requisites. Experience has shown that it possesses another invaluable quality, that of resisting the "dry rot," or fungus, which is so destructive to some other kinds of wood, particularly the oak. The place where it has been thoroughly tested is in the mines of France, where substitution of it for oak commenced in 1830. Before this oak had been generally used, and sticks of from 8 to 10 inches in diameter seldom lasted longer than a year or a year and a half. According to M. Francois, director of the mines, under the influence of the subterranean heat and moisture which proves so fatal to the oak, a yellowish viscious substance is formed on the locust, which protects the alburnum or sap wood from the influence of the surrounding air. This covering affords a protection to the wood for several months, by which time the alburnam is gradually converted into a porous ligneous substance to which the ulterior preservation of the wood is probably owing, the interior or heart-wood retaining, to an indefinite period, the healthy soundness and firm texture it first possessed. The saving in expense

is found very great, and the feeling of security much increased, since the decay of the timbers that supported the roof exposed the miners to continual dangers from its falling. The loss to the English navy from dry rot alone amounts to millions annually. Ships of the line have been built and launched, and have rotted at the docks without ever going to sea. Owing to the substitution of live oak for common oak in a great measure, our navy has hitherto suffered much less than European ones,—but we have not been exempt, and the known superiority of the locust should ensure its adoption wherever it can be procured in the national and commercial marine, both on the sea board and on the lakes.

G.

From the Southern Agriculturist.

AGRICULTURAL ESTABLISHMENT AT MOEGELIN, IN PRUSSIA.

[FROM JACOB'S TRAVELS IN GERMANY.]

About twelve or thirteen years ago, the King of Prussia, who, like his uncle, was always anxious to extend and improve the agriculture of his dominions, invited Von Thaer, who resided near Lunenburg, and whose celebrity was even then great, to settle in his kingdom, to assist in diffusing agricultural knowledge, and, by his management, set an example to the other great landed proprietors, which might stimulate them to adopt similar improvements. His majesty also wished him to conduct a seminary in which the knowledge of the sciences might be applied to husbandry, for the instruction of the young men of the first families.

The estate of Moegelin was given to him to improve and manage, as a pattern farm. It consists of eighteen hundred Berlin morgens, or about twevе hundred English acres. At that time the annual value was estimated at two thousand rix dollars,* but is now supposed to be worth twelve thousand; but some part of that increased value must arise from the buildings that have been since erected. The principal improvement, that of the soil, has arisen from the large flows of sheep, which in summer are folded on the land, and in winter make abundant manure, in houses constructed for their lodgings.

The Royal Institution, of which Von Thaer is the director, and which occupies a considerable portion of his extensive buildings, has three Professors besides himself. One for Mathematics, Chemistry, and Geology, one for Veterinary knowledge; and a third for Botany, and the use of the different vegetable productions in the Materia Medica, as well as for Entomology. Besides these, an experienced agriculturist is engaged, whose office it is to point out to the pupils the mode of applying the sciences to the practical business of husbandry.—The course commences in September.—During the winter months, the time is occupied in mathematics, and the first six books of Euclid are studied; and in the summer, the geometrical knowledge is practically applied to the measurement of land, timber, buildings, and other objects. The first principles of chemistry are unfolded. By a good but economical apparatus, various experiments are made, both on a large and small scale. For the larger experiments, the brew-house and still-house, with their respective fixtures, are found highly useful.

Much attention is paid to the analyzation of various soils; and the different kinds with the relative quantity of their component parts, are arranged with great order and regularity. The classification is made with neatness, by having the specimens of soil arranged in order, and distinguished by different colors. Thus, for instance, if the basis of the soil be sandy, the glass has a cover of yellow paper; if the next predominating earth be calcareous, the glass has a white ticket on its side; if it be red clay, it has a red ticket; if blue clay, a brown one. Over these tickets, others of a smaller sise indicate, by their color, the third greatest quantity of the particular substance contained in the soil. This matter may appear to many more ingenious than useful, and savoring too much of the German habit of generalizing. The classification of Von Thaer is, however, as much adopted, and as commonly used on the large estates of this country, where exact statistical accounts are kept, as the classification of Linnæus in natural history is throughout the civilized world.

There is a large botanical garden, arranged on the system of the Swedish naturalist, kept in excellent order, with all the plants labelled, and the Latin as well as the German names. An herbarium, with a good collection of dried plants, which is constantly increasing, is open to the examination of the pupils, as well as skeletons of the different animals, and casts of their several parts; which must be of great use in the veterinary pursuits. Models of agricultural implements, especially of ploughs, are preserved in a museum, which is stored as well with such as are familiar in Germany, as with those used in England or other countries. I remarked the absence but of two things used in this country, viz: the mole plough, and a new machine invented for sowing small seeds. The first of these would certainly be of little use in most parts of Germany; and the other is so new, that, excellent as it is, its adoption is by no means general, even in England.

The various implements used on the farm are all made by smiths, wheelers, and carpenters, residing round the institution; the workshops are open to the pupils; and they are encouraged, by attentive inspection, to become masters of the more minute branches of the economy of an estate.

It appeared to me, that there was an attempt to crowd too much instruction into too short a compass; for many of the pupils spend but one year in the institution; and thus only the foundation, and that a very slight one, can be laid in so short a space of time. It is, however, to be presumed, that the young men come here prepared with considerable previous knowledge, as they are mostly between the ages of 20 and 24, some few appeared to be still older.

The sum paid for each pupil is four hundred rix dollars annually; besides which, they provide their own beds and breakfasts. In this country, such an expense precludes the admission of all but youths of goood fortune. Each has a separate apartment. They are very well behaved young men; and their conduct to each other, and to the professors, was polite even to punctilio.

As I have not had an opportunity of visiting Hofwyl, and have met with no account of that Institution, written by any person who is well acquainted with many details on the subject of its agriculture, I cannot make a comparison between that widely-blazoned establishment, and the unostentatious Institution of Meogelin. I was indeed told that the plan and effects were far inferior; but, as my informants were Prussians, I make some allowance for the national vanity, which felt itself piqued that the establishment in Switzerland should be praised most highly, and their Royal Foundation be unknown beyond the boundaries of the kingdom to which it belongs.

* A rix dollar is seventy-five cents.

From the Farmers' Register.

REPORT OF THOMAS BLANCHVRD, ESQ. ON THE UPPER ROANOKE NAVIGATION, IN REGARD TO THE USE OF STTAMBOATS.

To A. Joner, Esq.

Agreeably to your instruction, I have examined the Roanoke River from Rock Landing, at the entrance of the canal, to Clarksville, in Virginia, for the purpose of ascertaining the practicability of navigating the said river between those points, by steamboats, and beg leave to submit the following remarks.

The present sluices, or most of them, are altogether inadequate for steamboat navigation; and in some places the fall of water is too great, to be overcome without locking. I have therefore made such remarks as I thought necessary, on the falls and shoals as I passed along, taking the names of the different places as given me by the boatman: but the distances between the obstructions, I could not accurately get, and have omitted them altogether.

The first rapid shoal that came under my notice, is called the Old House Ledge. It is a rapid of aqout 30 rods long—the fall of water in the distance about two feet, and the water in the sluice, about two feet and a half deep. This shoal can be made navigable for steamboats, by deepening the sluice at the head, and giving it a more gradual fall or inclined plane.

2nd. Eaton's Falls. The fall at this place is about ten feet, and is overcome by a short canal and lock. The latter will admit the passage of boats of only seventy feet long. The entrance to the lock requires straightening, and to be made deeper: the canal will require to be made straight, and some wider.

3d. Allen's Falls. The first rapid was about two feet fall in a short distance—was found to have two and a half feet water in the sluice, and must be improved. The second rapid, in the same falls, is much the same as the first, and can be sufficiently improved by sluicing.

4th. Hamlin's Shoals. The first bar is along side of an island—the rapid is short, and water very strong. The second bar is a ledge of rocks, extending the whole width of the river—the water in the sluice two feet deep, the fall two and a half, in fifteen or twenty rods. The third rapid is in all respects much like the second; the head of which, is the foot of the fourth sluice, which has a stone wall, and is shoal and rapid. The fifth sluice terminates these rapids. They are about two miles long, and form a continued succession of shoals the whole distance—the bed of the river being wide, the bottom composed of solid rock, and the fall more than sixteen feet. To make theese shoals navigable for steamboats, locks are necessary. To improve them by sluicing, would require one regular inclined plane over the whole of them, making a fall of water of about ten feet to the mile, which is as great a fall as can be overcome to advantage.

5th. Ballard's shoals. These shoals are three-fourths of a mile long, and about four feet fall in two short rapids—the sluices of which are crooked and shoal. They can

be improved by extending the sluices with side walls, and using dams and making them deeper.

6th, Pugh's Falls are about three-quarters of a mile long, having a fall of six feet. Here are the ruins of an old lock, which it will be necessary to re-construct, or build a new one. A short distance above this place, on the south side of Cotton Island, is a short rapid of about two feet fall, breaking over a ledge of rock, extending from the island to the opposite shore. The water is deep both above and below, and nothing more is wanting but to cut a sluice through the ledge.

7th. Lizard Creek. There are two rapids at this place, about one-fourth of a mile long. The first has a fall of about three feet in twenty rods—the second is not so strong, but both will require improving by locks or long sluices.

8th. Collar Bone Falls. At this point the water falls about two feet in thirty rods, and can be sufficiently improved by deepening the channel at the head of the sluice, and making a wall up the side of the north shore, thus forming a long sluice.

9th. Black Shoals. The fall here is about eighteen inches, in two short rapids, and can be easily improved by cutting sluices.

10th. Horseford Falls. The whole extent of these falls, is nearly two miles, but the greater part of the fall is in a distance of three-quarters of a mile, having a fall of about six feet, the whole fall being eight feet. The main fall is over a stratum of rocks the whole width of the river. One lock of about six feet lift would be sufficient for these falls.

11th. Short's Falls are one mile long, and can be improved by sluicing.

12th. Bug's Island Shoals, require to be made deeper and straight.

13th. Butcher's Creek Shoals. These falls are too rapid to be overcome without lockage—the most difficult place is around Eagle Point, where a wall has been constructed. The sluice is crooked. A dam of five feet lift would raise the water sufficiently for the two first rapids; the others can be improved by removing rocks, and making the sluices straight.

14th. Johnson's Sluice Shoals, are more than a mile long; the sluices are too narrow and crooked; the turn too short around the island. The sluices must be made wider and longer.

15th. Clarksville Falls. At this point there is a fall of about three feet. The sluice through the milldam is too short and rapid for steamboats. As here is a good mill seat, a dam and lock would be necessary for steamboats, and supplying water for a mill.

The examination I have been able to make of Roanoke River between the points already indicated, (Rock Landing & Clarksville,) induces me to believe that five locks at least are necessary, and there are not less than twenty-five shoal places where the water falls from one to three feet in short rapids requiring improvement. Sluices have been formed through these falls or rapids for batteau navigation, but they are generally too crooked and narrow for steam boat navigation. In addition to this, between the ponds formed by the several falls, there are many secret or hidden rocks near the surface in low water, which would be destructive to steam boats, and must be removed. The sluices at places where this mode of improvement is adopted, must be so extended as to give the water a gradual fall of not more than at the rate of ten feet to the mile. This rate of inclination may be considered the maximum fall that a steamboat will overcome, taking other boats in tow. The sluices should be three feet deep, and not less than thirty feet wide to navigate them with safety. The kind of boat I would recommend for the river is 85 feet long, and 13½ feet wide, with the wheel in the stern: such a boat, if built with my patent arches, would not draw more than 18 inches water.

As to the cost of making the necessary improvements on Roanoke River, for steam navigation, it would be impossible for me to form any correct estimate, having no adequate data upon which to found such estimate for work in this part of the country.

THOS. BLANCHARD.

THE GREAT WESTERN ROAD.—It will be recollected by our readers, that at the last session of Congress, the sum of $100,000 was appropriated for opening a military road from St. Peter's, near the falls of St. Anthony, on the upper Mississippi, along the Western frontiers of Missouri and Arkansas, to Red River. In conformity with this act, a Board of Officers has been appointed by the Secretary of War, consisting of Col. Taylor, and Major Smith, of the United States Army, and Major McNeil, of the Topographical Engineers, who were ordered to rendezvous at St. Louis, (where we perceive by the last papers, some of them had arrived,) to mature their plans for surveying the whole route for the road.. It is contemplated (we understand by a gentleman of the army who has seen the instructions of the Board) to establish a cordon of military posts along this road, for the more permanent and effectual protection of the western frontier.

CABBAGES.—If cabbages are set on old ground, they are very liable to be eaten by the cut worm, or if they escape this destroyer, they are frequently injured by lice; and they will not grow so well as on new ground A piece of rich mellow greensward, (pasture ground is preferable,) rather moist is very suitable for cabbages, and will generally yield large crops. Put a few quarts of manure and a pint of ashes into each hill, mix them together, adding a little earth, then cover the hill and set the plants in the evening, if the weather be fair, and water them if the ground be dry.—[Yankee Farmer.]

ATMOSPHERE.—The air on the tops of high mountains is so rare as to diminish the intensity of sound, to affect respiration, and to occasion a loss of muscular strength. The blood burst from the lips and ears of M. D. Humbolt as he ascended the Andes; and he experienced the same difficulty in kindling and maintaining a fire at great heights, that Marco Polo the Venetian, did on the mountains of Central Asia.

LIME, now so extensively and profitably used in agriculture, exists in its purest state in good marble. The refuse of marble, which is in great abundance at our valuable quarries in Montgomery and Chester counties, has recently been burnt into lime of the best quality, and promises to be a valuable acquisition to our farmers, and a profitable appropriation of a refuse article to the owners of marble quarries.—[Philadelphia Herald.]

CLOVER WITH OATS.—Many farmers are getting into the habit of sowing clover with their oats, under the belief that it takes better than with wheat or rye. The ordinary rotation in most parts of the union is corn, oats, rye or wheat with clover. In order to secure the enriching properties of clover, even in this rotation, it is said to be profitable to sow the clover, with a view of turning it under for rye, or wheat in the fall. The expense of seed is but trifling when compared with the benefits resulting from the pasture thus afforded from the time the oats are cut to that of plowing for winter grain—this alone is worth more than all the expense of seed, independently of the enriching qualities of the clover plowed in.

FOSSIL BEAR.—The fossil head of a bear was recently presented by M. Larrey to the French Academy of Sciences. It was of the species called the great cavern bear by Cuvier. It was found in the grottos of Mialet, department of Gard. It does not appear that there at present exists any species at all resembling it; and the excellent state of preservation in which it was discovered, induced M. Larrey to purchase it. M. St. Hilaire was charged with its examination, for the purpose of drawing up a report upon it.

RAILWAY IRON, LOCOMOTIVES, &c

THE subscribers offer the following articles for sale.

Railway Iron, flat bars, with countersunk holes and mitred joints,

						lbs.	
350 tons	2½ by	½,	15 ft in length, weighing			4 68/100	per ft.
280	" 2 "	½,	"	"	"	3 50/100	"
70	" 1¾ "	½,	"	"	"	2½	"
80	" 1¾ "	½,	"	"	"	1 25/100	"
90	" 1 "	½,	"	"	"	¾	"

with Spikes and Splicing Plates adapted thereto. To be sold free of duty to State governments or incorporated companies.

Orders for Pennsylvania Boiler Iron executed.

Rail Road Car and Locomotive Engine Tires, wrought and turned or unturned, ready to be fitted on the wheels, viz. 30, 33, 36, 42, 44, 54, and 60 inches diameter.

E. V. Patent Chain Cable Bolts for Railway Car axles, in lengths of 12 feet 6 inches, to 13 feet 2¼, 2¾ 3, 3¼, 3½, and 3¾ inches diameter.

Chains for Inclined Planes, short and stay links, manufactured from the E. V. Cable Bolts, and proved at the greatest strain.

India Rubber Rope for Inclined Planes, made from New Zealand flax.

Also Patent Hemp Cordage for Inclined Planes, and Canal Towing Lines.

Patent Felt for placing between the iron chair and stone block of Edge Railways.

Every description of Railway Iron, as well as Locomotive Engines, imported at the shortest notice, by the agency of one of our partners, who resides in England for this purpose.

Mr. Solomon W. Roberts, a highly respectable American Engineer, resides in England for the purpose of inspecting all Locomotives, Machinery, Railway Iron &c. ordered through us

A. & G. RALSTON.

23-tf Philadelphia, No. 4, South Front st.

RAILROAD CAR WHEELS AND BOXES, AND OTHER RAILROAD CASTINGS.

Also, AXLES furnished and fitted to wheels complete at the Jefferson Cotton and Wool Machine Factory and Foundry, Paterson, N. J. All orders addressed to the subscribers at Paterson, or 60 Wall street, New-York, will be promptly attended to.

Also, CAR SPRINGS

Also, Flange Tires, turned complete

J8 ROGERS, KETCHUM & GROSVENOR

TO RAILROAD CONTRACTORS.

PROPOSALS will be received until the 8th day of December next, for the graduation and masonry of the first ten miles of the Gainsville and Narkeeta Railroad. A profile of the route, with plans and specifications of the work, will be exhibited at Gainsvill , for ten days previous to the time of letting and all other information given, on application to the subscriber or to the Assistant Engineer. Recommendations will be expected in all cases, of persons not known to the officers of the company or to the Engineer.

For the information of persons at a distance, it may be remarked, that this road commences at the town of Gainsville, on the Tombeckby river, and extends twenty-two miles south-west to Narkeeta in the State of Mississippi. The Tombeckby is navigable for Steamboats the greater portion of the year and having a direct communication with Mobile and New-Orleans, will afford facilities for procuring the supplies necessary for the hands employed on the work, or for their ready conveyance hither, if procured from a distance. The country through which the road is located, being perfectly healthy, and the mildness of the climate admitting of operations throughout the winter season renders the contract peculiarly desirable to those wanting winter employment. To an enterprizing and energetic contractor the construction of this road offers the prospect of a profitable job.

D. H. BINGHAM, C. E.

Gainsville, Ala. Sept. 21, 1836. 42—tDec1

ARCHIMEDES WORKS.

(100 North Moor street, N. Y.)

NEW-YORK, February 12th, 1836.

THE undersigned begs leave to inform the proprietors of Railroads that they are prepared to furnish all kinds of Machinery for Railroads, Locomotive Engines of any size, Car Wheels, such as are now in successful operation on the Camden and Amboy Railroad none of which have failed—Castings of all kinds. Wheels, Axles, and Boxes, furnished at shortest notice.

H. R. DUNHAM & CO.

4—ytf

THE NEW-JERSEY, HUDSON AND DELAWARE RAILROAD.

NOTICE is hereby given that under and by virtue of an act of the Legislature of the State of New-Jersey, entitled, "A further supplement to an act to incorporate the New-Jersey, Hudson and Delaware Railroad Company, passed the 8th day of March A. D., eighteen hundred and thirty-two," the books to receive subscriptions to the Capital Stock of said Company will be open at 10 o'clock, A. M., of each of the days following, viz:

On Tuesday, the 8th Nov. next, at Joseph Tilman's, Columbia, N. J.

Wednesday and Thursday, 9th and 10th Nov. next, at John J. Blair's, Gravelhill, N. J.

Friday, 11th Nov., at George Crockett's Marksboro, N. J.

Saturday, 12th Nov., at Peter B. Shafer's, Stillwater, N. J.

Monday, 14th Nov., at John S. Warbasse's, Newton, N. J.

Tuesday and Wednesday, 15th and 16th Nov., Abm. Brav's, Augusta, N. J.

Thursday, 17th Nov., at Stephen Ward's, Hamburg, N. J.

Friday and Saturday, 18th and 19th Nov., at H. Vibbert's, Dechertown, N. J.

Tuesday and Wednesday, 13th and 14th Dec., at United States Hotel, Newburgh, New-York.

Thursday, 15th Dec., at No. 34 Wall-street, city of New-York.

And continue open at the last mentioned place until the whole stock shall have been subscribed for, or at the discretion of the Commissioners. But if the whole of the Stock shall be subscribed for at either of the above mentioned places, the books will be immediately closed.

The Capital Stock is $500,000 with liberty to increase to $800,000, divided into shares of $100 each.

The sum of $5 on each share is required to be paid on subscribing.

SAMUEL FOWLER,
JOHN BELL,
JOSEPH CHANDLER,
WILLIAM HYBERGER,
ENOS GOBLE,
DANIEL HAINES,
SAMUEL PRICE,
JOHN I. BLAIR,
JOSEPH E. EDSALL,
COMMISSIONERS

Dated Oct. 3rd, 1836 41—9t

PATENT RAILROAD, SHIP AND BOAT SPIKES.

☞ The Troy Iron and Nail Factory keeps constantly for sale a very extensive assortment of Wrought Spikes and Nails, from 3 to 10 inches, manufactured by the subscriber's Patent Machinery, which after five years successful operation, and now almost universal use in the United States, (as well as England, where the subscriber obtained a patent,) are found superior to any ever offered in market.

Railroad Companies may be supplied with Spikes having countersink heads suitable to the holes in iron rails, to any amount and on short notice. Almost all the Railroads now in progress in the United States are fastened with Spikes made at the above named factory—for which purpose they are found invaluable, as their adhesion is more than double any common spikes made by the hammer.

*** All orders directed to the Agent, Troy, N. Y., will be punctually attended to.

HENRY BURDEN, Agent.

Troy, N. Y., July, 1831.

*** Spikes are kept for sale, at factory prices, by I. & J. Townsend, Albany, and the principal Iron Merchants in Albany and Troy; J. I. Brower, 222 Water street, New-York; A. M. Jones, Philadelphia; T. Janviers, Baltimore; Degrand & Smith, Boston.

P. S.—Railroad Companies would do well to forward their orders as early as practicable, as the subscriber is desirous of extending the manufacturing so as to keep pace with the daily increasing demand for his Spikes. (1J23am) H. BURDEN.

NEW ARRANGEMENT.

ROPES FOR INCLINED PLANES OF RAILROADS.

WE the subscribers having formed a co-partnership under the style and firm of Durpee, Coleman & Co., for the manufacturing and selling of Ropes for inclined planes of railroads, and for other uses, offer to supply ropes for inclined planes, of any length required without splice, at short notice, the manufacturing of cordage, heretofore carried on by S. S. Durfee & Co., will be done by the new firm. All orders will be promptly attended to, and ropes will be shipped to any port in the United States.

8th month, 8th, 1836. Hudson, Columbia County, State of New-York.

E. S. TOWNSEND, GEORGE COLEMAN.
ROBT. C. FOLGER, SYDNEY S. DURFEE

33—tf.

FRAME BRIDGES.

THE subscriber would respectfully inform the public, and particularly Railroad and Bridge Corporations that he will build Frame Bridges, or vend the right to others to build, on Col. Long's Patent, throughout the United States, with few exceptions. The following sub-Agents have been engaged by the undersigned who will also attend to this business, viz.

Horace Childs,	Henniker, N. H.
Alexander McArthur,	Mount Morris, N. Y.
John Mahan,	do do
Thomas H. Cushing,	Dover, N. H.
Ira Blake,	Wakefield, N. H.
Amos Whitemore, Esq.,	Hancock, N. H.
Samuel Herrick,	Springfield, Vermont.
Simeon Herrick,	do do
Capt. Isaac Damon,	Northampton, Mass.
Lyman Kingsly,	do do
Elijah Halbert,	Waterloo, N. Y.
Joseph Hebard,	Dunkirk, N. Y.
Col. Sherman Peck,	Hudson, Ohio.
Andrew E. Turnbull,	Lower Sandusky, Ohio.
William J. Turnbull,	do do
Sabried Dodge, Esq.,	(Civil Engineer,) Ohio.
Booz M. Atherton, Esq.	New-Philadelphia, Ohio.
Stephen Daniels,	Marietta, Ohio
John Rodgers,	Louisville, Kentucky.
John Tillson,	St. Francisville, Lous'a.
Capt. John Bottom,	Tonawanda, Penn
Nehemiah Osborn,	Rochester, N. Y.

Bridges on the above plan are to be seen at the following localities, viz. On the main road leading from Baltimore to Washington, two miles from the former place. Across the Metawamkeag river on the Military road, in Maine. On the National road in Illinois, at sundry points. On the Baltimore and Susquehanna Rrailroad at three points. On the Hudson and Patterson Railroad, in two places. On the Boston and Worcester Railroad, at several points. On the Boston and Providence Railroad, at sundry points. Across the Contocook river at Hancock, N. H. Across the Connecticut river at Haverhill, N. H. Across the Contoocook river, at Henniker, N. H. Across the Souhegan river, at Milford, N. H. Across the Kennebec river, at Waterville, in the state of Maine.—Across the Genesse river, at Mount Morris, New-York, and several other bridges are now in progress.

The undersigned has removed to Rochester, Monroe county, New-York, where he will promptly attend to orders in this line of business to any practicableextent in the United States, Maryland excepted.

MOSES LONG.

General Agent of Col. S. H Long.

Rochester, May 22d, 1836. 19y-tf.

ALBANY EAGLE AIR FURNACE AND MACHINE SHOP.

WILLIAM V. MANY manufactures to order, IRON CASTINGS for Gearing Mills and Factories of every description.

ALSO—Steam Engines and Railroad Castings of every description.

The collection of Patterns for Machinery, is not equalled in the United States. 9—1y

WESTERN RAILROAD.

PROPOSALS will be received at the Office of the Western Railroad Corporation, in Worcester, untilthe 20th November, for the grading and masonry of the first division of the Road, extending from Worcester to East Brookfield, a distance of 19¼ miles.

Plans, profiles, etc., will be ready for examination after the 10th November. W. H. SWIFT,

Resident Engineer.

Worcerter, Mass. Oct. 19, 1836 43—tnov20

STEPHENSON,

Builder of a superior style of Passenger Cars for Railroads.

No. 264 Elizabeth street, near Bleecker street, New-York.

RAILROAD COMPANIES would do well to examine these Cars; a specimen of which may be seen on that part of the New-York and Harlaem Railroad now in operation. 125tf

AMES' CELEBRATED SHOVELS, SPADES, &c.

300	dozens	Ames' superior back-strap Shovels	
150	do	do do plain	do
150	do	do do cast steel Shovels & Spades	
150	do	do Gold-mining Shovels	
100	do	do plated Spades	
50	do	do socket Shovels and Spades.	

Together with Pick Axes, Churn Drills, and Crow Bars (steel pointed,) manufactured from Salisbury refined iron—for sale by the manufacturing agents,

WITHERELL, AMES & CO.

No. 2 Liberty street, New-York.

BACKUS, AMES & CO.

No. 8 State street, Albany

N. B—Also furnished to order, Shapes of every description, made from Salsbury refined Iron 4—ytf